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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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METEOROLOGICAL CHART—LAKE STORMS.

The Department of Agriculture, Weather Bureau, has published a meteorological chart of the lakes giving valuable data for May. It appears that on the average six storms pass over the lake region in May, the majority of which, however, can be safely weathered by the larger craft. The number of storms during the last twenty years has neither increased nor diminished. There were more storms in 1892 than in any other year, yet the loss to marine interest was not so great as in the years 1894 and 1895. During the ten years, 1877 to 1887, the money value of vessels lost or damaged amounted to about half a million dollars; from 1887 to 1896, both inclusive, the loss amounted to a little over a million and a half, although fewer vessels were lost or damaged during the last named period.

By far the greater number of storms that pass over the lake region come from the northwest. The storms of May, and also of the summer months, are not so severe as those of late fall and winter. Neither are the outward signs of their approach precisely the same. The dangerous winds of summer are the squall winds which accompany thunderstorms. They last but a short time, and their coming can almost always be foretold by the appearance of the western sky. The barometer is unsteady, rising and falling quite abruptly. The day is generally close and oppressive and the clouds present a broken and heaped up appearance.

Probably the most disastrous May storm that has occurred in the lake region during the last twenty-five years crossed the southern end of Lake Michigan on May 18, 1894. The day previous had been warm and sultry and numerous thunderstorms occurred throughout Wisconsin, Illinois, Michigan, Ohio, and Indiana. On the morning of the 18th the winds were north-northeasterly and exceedingly gusty, the velocity varying from thirty miles per hour one minute to sixty the next. The sea likewise was unusually heavy, the waves being short and choppy, measuring from 10 to 15 feet from hollow to crest. To add to the danger of wind and sea, rain mixed with snow fell during the afternoon hours. As a result of the storm 26 lives were lost, 14 vessels were totally and 12 others partially wrecked, involving a money loss of over \$80,000.

The storm that has the greatest cause to be remembered in lake shipping circles swept over Lake Michigan, October 16, 1880, nearly eighteen years ago.

The weather on October 15 was warm and pleasant, the thermometer ranging from 60° to 70°. Light northerly winds prevailed over Lake Superior and southerly over Lake Michigan. The storm began about midnight of the 16th with easterly shifting to southwesterly winds at the Straits of Mackinac and southwesterly from Grand Haven southward. The barometer fell to 28 inches (unreduced) in Minnesota on the morning of the 16th and continued low

throughout the upper lakes until the morning of the 17th. Violent southwesterly gales on Lake Michigan raged all day of the 16th and a part of the 17th. The temperature dropped from 65° to the freezing point and snow fell as far south as Chicago. The loss of life was very great, nearly one hundred souls going down on the Goodrich liner Alpena, Grand Haven to Chicago. This vessel was last seen about 30 miles from Chicago.

In all about 90 vessels were wrecked or badly damaged and 118 lives were lost as the result of this storm.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., April 28, 1898.

RUSSELL ISLAND UPPER LIGHT No. 12.—Notice is hereby given that, on or about May 5, 1898, this fixed red lantern light will be moved to and established on the structure on the upper end of the shoal at the head of Russell Island, and about 3,600 feet ($1\frac{1}{8}$ statute mile) N. by E. $\frac{3}{4}$ E. (true) from Russell Island Light No. 11, with which it will form a range to guide in the St. Clair river above the head of the shoal.

The light will be 14 feet above the water. The structure consists of a crib, in 15 feet of water, surmounted by a white lantern house, from the top of which the light will be shown.

By order of the Light-House Board.

FREDERICK V. MCNAIR,
Commodore, U. S. Navy, Chairman.

The lists of lights and fog signals of the United States or the lists of beacons and buoys in the different light-house districts, published by the Light-House Board, can be obtained, free of charge, on the application to the Light-House Board, Washington, D. C., the inspectors and engineers of the several light-house districts, the United States Custom Houses, the principal agencies of the United States Coast and Geodetic Survey, the Hydrographic Office of the United States Navy, and the Branch Hydrographic Offices.

DIFFERENCE OF DRAFT IN SALT AND FRESH WATER.

To find the difference of immersion or draft in salt and fresh water. If from salt to fresh, multiply the draft of salt water by 36 and divide the product by 35. If from fresh to salt, multiply the draft of fresh water by 35 and divide the product by 36.

Example: Required the draft of a vessel in fresh water when drawing 20 feet in salt water: $20\text{ft.} \times 36 = 720 \div 35 = 20\text{ } 5\text{ } 7\text{ in.}$

Table of drafts worked out by the above formula:

Fresh to Salt.			Salt to Fresh.		
Water Mark in Fresh.	Would Draw in Salt.		Water Mark in Salt.	Would Draw in Fresh.	
Ft.	Ft.	In.	Ft.	Ft.	In.
24	23	4	24	24	$8\frac{1}{4}$
22	21	$4\frac{5}{8}$	22	22	$7\frac{1}{2}$
20	19	$5\frac{5}{8}$	20	20	$6\frac{7}{8}$
18	17	6	18	18	$6\frac{1}{2}$
16	15	$6\frac{5}{8}$	16	16	$5\frac{1}{2}$
14	13	$7\frac{3}{8}$	14	14	$4\frac{3}{4}$
12	11	8	12	12	$4\frac{1}{8}$
10	9	$8\frac{5}{8}$	10	10	$3\frac{3}{8}$
8	7	$9\frac{3}{8}$	8	8	$2\frac{3}{4}$
6	5	10	6	6	$2\frac{1}{8}$

English stevedores are not behind the times. A few days ago the Johnston liner Ikbai, from Baltimore, entered the South Hornby Dock, Liverpool, with a general cargo. This was discharged, the vessel coaled, she loaded 2,000 tons of outward cargo, and sailed—all within forty working hours.

SANDUSKY HARBOR.

Relative to the report about the entrance to Sandusky harbor shoaling, Leut.-Col. Jared A. Smith, in charge of rivers and harbors of that district, made a personal investigation of the "deep hole" and bar off the point, last week and was pleased with the condition of the channel. Colonel Smith is anxious that the government shall maintain a sufficient depth of water in the channel which will admit large freighters without difficulty. Some days ago a report reached him that the "deep hole" was filling in as a result of the construction of the jetty, and that it had become necessary to change the location of the outer buoy at the mouth of the bay. The report was unreliable, said Colonel Smith, but to determine whether or not the new jetty was accomplishing the desired effect in regard to removing the bar, he ordered engineer Blunt to make a survey of the channel. The result of the investigation, although not complete, shows that there is plenty of water over the bar, that the "deep hole" is extending out into deep water in the lake and is in some places from two to four feet deeper than last year. The jetty, which has been built out from the mainland a distance of about 1,825 feet, proves that the current from the bay maintains its velocity out beyond the end of the jetty, thus carrying the sand over the bar and tending to move the obstruction which has given deep-laden vessels some difficulty. The jetty was constructed with a view of remedying this condition of affairs, and it is believed that its further extension will entirely overcome the formation of a bar between the "deep hole" and the lake. It was originally intended to make the jetty 3,000 feet long, but Colonel Smith will recommend an extension of 2,300 feet more, making the total length of the jetty over 5,000 feet. The recent soundings taken in the channel show that there was 17.2 feet of water, while in a good many places it was 18 feet. The building of the new bay ranges has somewhat changed the course to be followed by vessels, and engineer Blunt advises masters, when bound in, to follow the red cans to starboard, keeping about 50 to 75 feet off, and when about 400 inside of red spar buoy No. 10 to work over the new range until they come to the bend in the straight channel.

AN ADDITION TO THE MOSQUITO FLEET.

It is reported from Benton Harbor, Mich., that M. J. Stefens, of Chicago, owner of the handsome yacht Laura S, has sold his craft to the government to be added to the navy. She is 100 feet long and has fine, powerful engines, being able to make sixteen miles an hour. The price paid for her is said to have been \$30,000. The Laura S will leave in a few days to join the mosquito fleet on the Atlantic. Owing to her small size she can pass down the Erie canal and reach New York in much less time than if she had to run the St. Lawrence.

AUTOMATIC RELEASING HOOK FOR BOATS' DAVIT TACKLE BLOCKS.

After practically testing the Standard Automatic Releasing Hook in many of the cruisers and gunboats, the Bureau of Construction and Repairs, U.S.N., have ordered that a supply of these hooks be purchased and kept at the several navy yards, to equip the boats or vessels repairing and fitting out at these yards. This undoubtedly points to the fact that this device, has by its merits alone, met the approval of the department and will hereafter be a part of the equipment of all vessels in this branch of the service. The receipt of orders from this source recently received, together with orders from the Light-House Board, revenue marine, and coast survey branches of the service, and the new passenger and freight steamers building, as well as the steamship lines who are anxious and have a thought for the safety of their patrons, keeps the Standard Automatic Releasing Hook Co. pretty busy and shows that a good thing will in time be found out and used.

NEWS AROUND THE LAKES.

CHICAGO.

Special Correspondence to The Marine Record.

Capt. Louis Hohmann has purchased the steamer Minnie B. from Capt. Gus. Schultz.

Considerable tonnage for grain has been chartered this week at 1½ cents on wheat and 1¼ cents on corn to Buffalo.

At the Independent floating dry dock the tug Robt. Tarrant is in for calking all over. The tug C. M. Charnley is receiving repairs to stem and to pilot-house.

Capt. John Prindiville chartered the steamer Oscar T. Flint for corn to Sandusky at 1¼ cents, the steamer Canisteo for corn to Kingston at 3 cents, the steamer Vulcan for corn to Buffalo at 1¼ cents.

The Hines Lumber Co.'s new fleet, comprising Santa Maria, Capt. Walter Hamilton, and consorts, S. E. Marvin and R. L. Fryer arrived here on the 26th April, from Baraga, with 2,500,000 feet of lumber.

The Chicago Ship Building Co. have had in their dock the tugs J. C. Ames and C. G. Crosby for general repairs and calking, the steamer Boston for some new steel plates, the steamer City of Charlevoix for repairs and to fasten wheel, the steamer Westover for a new stern bearing; the steamer Lindsay had her topsides calked.

J. L. Higgle, Jr., Noble K. Higgle and Capt. Edward Napier have organized a company to be known as the Chicago River Freight Transfer Co., with offices at 1 Franklin St., Room 10. The company have the tugs Mary McClellan and M. Shields and three lighters of 400 tons each, with which it is their intention to transfer all kinds of freights on Chicago river.

J. J. Rardon & Co. chartered the steamer Thos. Davidson for corn to Buffalo at 1¼ cents, the steamer Phoenix for corn to Parry Sound at 1½ cents, steamer Inter Ocean and consort Richard Winslow for corn to Prescott at 2¾ cents, steamers Arizona and Lindsay for corn to Kingston at 2¾ cents, barge Australia for wheat to Buffalo at 1¼ cents, steamer Italia for corn to Buffalo at 1½ cents, steamer City of London for corn to Buffalo at 1¼ cents.

A dispatch from Algomah says: "The steamer Albert Soper became disabled through the breaking down of her machinery and was driven ashore at Foscora, about six miles north of here. She pounded on the rock until a hole was broken in the bow, and then filled with water. The wreck is now lying on a reef of rocks in ten feet of water. The Sturgeon Bay life-saving crew, numbering 12, are still on board." The steamer is owned by the Soper Lumber Co., of Chicago. Capt. Thos. J. Higgins is master of her, and Robt. Lyons mate.

The steam canal boat Novelty was in dock for some new bottom plank, some new knees, and her butts and bottom calked. The steam yacht Hinda was in for some new bottom plank, also bottom calking, scraping and painting and repairs to stern bearing. The tug Rebel received some new bottom planks aft, new transom and calking all over. The tug Andrew Green received a new wheel and sea-cock and repairs to stern bearing. The steamer Santa Maria is in dock for some new bottom plank, amidships, bottom calking and a new wheel.

Vessel owners have a working example of the twenty-foot channel in the cargo which the steamer Andrew Carnegie discharged at Owen Sound. It consisted of 230,000 bushels, or 6,440 tons, of corn. It was loaded Monday at Counselman's elevator at South Chicago, where there is an unlimited depth of water. There was also no limit to the draft at Owen Sound, so the Carnegie was able to take a record-breaking load. She did not load to her full depth, even with her big cargo, owing to her fear of locating new reefs at the Straits or in Georgian Bay. The former record was held by the Australia, which carried away 226,000 bushels of corn at the opening of navigation.

The biggest insurance certificate ever issued on a single cargo of grain on the lakes was that written by J. J. Rardon & Co. on wheat aboard the Australia. It was for \$273,700. The cargo consisted of 210,539 bushels, or 6,316 tons, by far the largest ever going out of the Chicago river. In loading the big cargo the Australia followed a course which will be frequent after the government has improved the river for modern vessels and until the tunnels are lowered. Part of the load was put on up the north branch, and then the balance was loaded at the Illinois Central elevator below the tunnels. Not much inconvenience follows this way of doing business. The Australia's wheat was insured at \$1.30 per bushel, a price which has not appeared on insurance policies for many a year before. It was shipped by A. Geddes & Co., acting for Joseph Leiter, to Buffalo for export.

BUFFALO.

Special Correspondence to The Marine Record.

The wooden steamer John Oades, is docked at the Union dry dock this week for repairs.

Fire on the Rochester & Pittsburg ore docks destroyed two hoists and inflicted other damage to the amount of several thousand dollars.

The hull of the burned steamer Maine has been raised at Tonawanda, and syphoned of water so that a survey may be made on the hull and machinery.

It was found out last Saturday that the steamer Tampa was 632 bushels short in her Chicago wheat cargo. The ship will have to pay a stiff rate for shortage.

Capt. Mansfield, of the steamer Sacramento, denied that his boat struck the pier at the "Soo" as reported last week, and says he is sure she did not touch anything but Vidal's reef. She docked here for a new wheel.

The first cargo of Canadian wheat was received here this week. It was brought by the City of Genoa, and amounted to 78,000 bushels. It was Manitoba grain, loaded at Fort William, and is consigned to English dealers.

Reports from Montreal indicate that the ocean freight rates from that point are on the increase, owing to the demands from United States points. Within the last week there has been a wonderful demand for freight space. At Montreal there is already little or no space left for May and June sailings.

The new tug C. F. Dunbar was launched on Saturday at the Union dry dock. The Dunbar is built for the Maytham Line, and is of steel. She is the only tug on the lakes having triple-expansion engines, and they develop 1,400 horse-power. The dimensions of the hull are 91 feet over all, and 23 feet beam.

Commander H. A. Hanford, U.S.N. inspector of the tenth light-house district, says that all light-house work is two weeks ahead of last year, and the commander surprised many of the keepers by his early visit. At several places visited the spring cleaning and painting had not been started. A new gas buoy is to be placed in the St. Lawrence river at the lower Narrows.

The railroad elevators have reorganized and will try to maintain a rate of ½ cent for elevating grain from vessels. Their managers say that such a rate can be maintained. They will now hang together. The canal elevators are expected to form a second pool at a lower rate. They are handicapped in the call on business by having no rail connections.

By directions of the Secretary of War all persons are warned that it is dangerous to navigate the waters of the east end of Lake Erie between the southern end of the present Buffalo breakwater and Stony Point, where the new breakwater is now under construction, and all persons so navigating do so at their own risk. And further, all persons are warned that the operations of the government contractors engaged in extending the breakwater must not be interfered with.

Quite a little dredging is to be done inside Buffalo harbor. It has been ordered that the Blackwell canal be dredged full width, except ten feet outside each dock line and all obstructions removed from Buffalo river to the south end of Blackwell canal, so as to create a depth of twenty feet of water below low water mark in a channel, the depth diminishing from the sides of the channel to eighteen feet at ten feet from each dock line. The river also is to be dredged full width, except ten feet outside each dock line and all obstructions removed, from the west end of north pier to 400 feet south of Aurora street, so as to create a depth of twenty feet of water below low water mark in a channel 140 feet in width, the depth diminishing from the side of the channel to eighteen feet at ten feet from each dock line.

DETROIT.

Special Correspondence to The Marine Record.

An unknown steamer collided with the gas buoy at the middle ground abreast of Port Huron Saturday and extinguished the light.

The railroad car ferry and ice crusher St. Ignace will be put in dry dock by the Detroit Dry Dock Co. for general overhauling and repairs.

Saturday night trips between Cleveland and Detroit will be resumed after May 1st by the Detroit & Cleveland Navigation Co. The fare for the round trip is \$2.

The schooner Manitou, owned by Sidney Adams, of Marquette, has been purchased by Capt. William Quinland, of this port. She will be repaired at Port Huron and employed in the lumber trade.

New Orleans owners of the ocean tug Wilmot, recently sold to the government, have secured figures from several lake ship builders on a tug to take the place of the Wilmot, and will probably place a contract within a few days.

It is noted that the Chicago Lumber Carriers' Association are working in connection with the lately organized body of lumber carriers at this port, and that the combine seems to be in every way conducive to the best interests of vessels engaged in the lumber trade.

The steamer Senator is making a cargo carrying record by loading 224,000 bushels of corn, at Milwaukee, without trimming, for Buffalo. This is the largest Milwaukee grain cargo ever shipped up to date and it is to be hoped that she will get over the shoal spots with it all right.

The new steel steamship now building at the Wyandotte yards of the Detroit Dry Dock Co., for the Western Transit Co., Buffalo, is expected to be ready for business between June 15 and July 1. She will be 400 feet long, 45½ feet beam, 28 feet deep, with a carrying capacity of 5,000 tons and a speed of 13 miles an hour when loaded.

The wooden steamer Orinoco was successfully launched from Davidson's Bay City shipyard on Saturday last. There was a launch from these yards on the previous Saturday and it is now on the tapis that a similar event will take place on the next two consecutive Saturdays. This shows good planning and fine executive ability at the shipyard.

The steamer Iron King lost her propeller wheel when passing through the Limekiln Crossing, though her anchors being let go in time, she lay afloat until she was taken hold of and

towed here for a new wheel. The Northern King broke her propeller at nearly the same spot and she also was brought here in tow. Both accidents occurred within a few hours of each other.

The barge Sidney O. Neff is about to be converted into a steam vessel. Capt. Sam Neff recently sold her to parties residing in Northern Michigan, who made the purchase with this object in view. The Neff's engine will be a fore-and-aft compound, 15 and 30 by 28 inches, from the works of S. F. Hodge & Co., The Riverside Iron Works. The boiler is now being built at Ferrysburg, Mich.

Alfred Noble, of the Deep Waterways Commission, has returned to this city. The surveys in the Niagara Falls region are completed, and the party that has been working there was recently transferred to Troy, to begin the survey of the Lake Champlain route. It is expected that the work will all be completed before winter. The commissioners are now at work on the most complicated of the problems that are set them—the regulation of the level of Lake Erie.

The Lee-Penberthy Manufacturing Co. have issued, this week, a little volume of valuable and useful information to engineers, steam users, buyers and sellers of all goods pertaining to steam. The various tables and condensed information contained in this book will untangle and make clear many knotty problems and answer many questions constantly presenting themselves in this line of business and its class of goods. Automatic injectors are their specialty.

Capt. Charles Peltier, a veteran vesselman, died here last Friday afternoon. He had been suffering for two years with a disease caused by fatty degeneration of the heart. Capt. Peltier was sixty-eight years of age, and from an early age had been connected with the lake trade. He was on a sailing vessel for many years, and was identified with several steam barge ventures. He sailed the W. B. Jenness for nineteen years. It is said that in all the years he sailed he never had a serious accident and never had a boat wrecked.

During the month of April the marine postoffice received 13,884 letters from the local department, as against 4,098 for April of last year; delivered to boats 9,905, as against 2,590 last year, and received from boats 3,156, as against 1,072. This large increase is partially explained by the fact that the mail boat was in operation only 19 days in April, 1897, while at the time the last report was made the boat had been in commission 29 days. But, allowing for this difference, the business this year shows an increase of over 200 per cent. "If this keeps on," said the postmaster, "we shall have a government boat of our own next year."

CLEVELAND.

Special Correspondence to The Marine Record.

The small steamer Manistique was in the Cleveland dry dock this week and had butts calked.

The V. H. Ketcham and the Empire State are undergoing repairs in the Ship Owners' dry dock.

Rev. W. H. Law, a missionary stationed at Les Cheneaux Island, Michigan, is in the city this week visiting vesselmen.

The steamer William R. Linn loaded a cargo of 6,220 tons of iron ore at Escanaba, on Monday. This is the largest cargo ever taken from that port.

The steamer State of Ohio, of the C. & B. line, made her first trip to Buffalo, Monday night. Daily trips between Cleveland and Buffalo will be made hereafter.

Mr. Luther Allen, of the Globe Iron Works Co., has been "under the weather" for the past couple of weeks, but is now improving and will soon be at business again.

Capt. A. W. Hawgood, late marine superintendent of the F. & P. M. line, has resigned his position and returned to Cleveland to enter into a more lucrative business. Capt. Hawgood has been located at Ludington about one year, having succeeded the late Capt. Martin.

The schooner Polynesia on her first trip up got into trouble on Ballard's Reef. She let go her stern anchor, which caught a rock and was lost. Capt. Hackett recovered it and left it at Amherstburg. Monday the tug Saugatuck took it to Toledo and it was placed aboard the Polynesia.

Mr. John F. Pankhurst, vice president and general manager of the Globe Iron Works Co., has returned home after a prolonged stay in the east. Mr. Pankhurst's health is very much improved and the fine summer weather experienced in Cleveland will no doubt enable him to "get to windward" again.

A small cargo of timber was brought into this port during the week after a rather eventful voyage. It was shipped from Marysville, Mich., last fall by the City of Concord, but was jettisoned on the way. It drifted to Kingsville, Ontario, where the customs authorities took care of it. The owner thus recovered his property.

Much as those vessels who have iron ore charters for the season would like to start in carrying it, shippers seem to be in no hurry to rush the ore to Lake Erie. Besides the large quantity (nearly four million tons), on the docks at the opening of navigation, the furnaces have been so liberally supplied that there is no call for direct shipments by lake and rail. It is also expected that the freight on the railroad will be reduced for the entire season within a few days.

Two members of the life-saving crew at this port belong to the Naval Reserves. It was their intention to resign their positions in order to go with the Reserves if they were called out, but Captain Motley wrote to his superior officer on the

subject and has received a reply stating that any member of the crew who desired to go to war would be given a year's leave of absence and would be readmitted to the service at the expiration of that time without being required to pass any examination other than physical.

The Brown Hoisting & Conveying Machine Co., through their New York office, recently closed a large contract with the government for four separate coal-handling plants for the Navy Department for coaling battleships; two of these plants to be located at Key West, and two at Dry Tortugas, each plant consisting of two of Brown's patent bridge tramways with self-filling buckets of two tons capacity each, making eight bridges in all. The contract price was \$151,000 which was \$60,000 higher than the lowest bid. They have five months in which to complete the work.

The fleet of the Bessemer Steamship Co. now comprises eighteen large vessels with three more in course of construction, and when they are completed it is figured that the line will have floating steel warehouse room for a neat 100,000 tons at one time. Allowing ten days for a round trip, and carrying cargo each way, this totals up to nearly five million tons of carrying capacity for one season. Oh, yes, it cuts quite a figure, yet I don't hear very much about the line or its modest general manager, Mr. L. M. Bowers, but he is all there just the same, and the patentee of an excellent stockless anchor, too.

A special from Alpena says the tugs engaged in the release of the steamer J. H. Outhwaite were discharged on Wednesday, and operations will be suspended until the weather clears. Work on the wreck has been greatly delayed by bad weather. The Outhwaite is not greatly damaged since she went on, but both of the steel pontoons hired from Captain Reed have been stove in. Including this damage, the work has already cost the underwriters \$20,000. It is understood that efforts are now being made to contract for the release of both the Outhwaite and Barr, the underwriters expedition having in a measure failed.

Bids for the furnishing and placing of stone for the foundation of the extension of the east breakwater were opened this week in the office of Colonel Jared A. Smith, Corps of Engineers, U. S. A. The specifications called for a maximum of 25,000 tons of rip-rap and 75,000 tons of filling stone, the government guaranteeing to use at least 85,000 tons of 2,000 pounds each. Bids were requested for the two items separately and for the work as a whole. There were six bidders, of whom James B. Donnelly, of Buffalo, N. Y., was the lowest, at 92 cents a ton for the work as a whole. The next lowest bidder was the Kelly Island Lime and Transport Co., at 97½ cents. The other four bids were all considerably higher.

FLOTSAM, JETSAM AND LAGAN.

The range lights in Duluth harbor are now all in position and lighted.

Shipments of iron ore from Ashland for April, were 75,512 tons. Of this 65,289 tons were taken last week.

There were thirteen vessels of the Davidson fleet in the Duluth-Superior harbor at one time on Saturday last.

At Escanaba on Monday a cargo of 3,100 tons of iron ore was placed on the steamer Ferdinand Schlesinger in two hours and forty minutes.

The Fall River Line announces the resumption of its Sunday service, commencing next Sunday, May 1st, the leaving time from New York to be 5:30 p. m., the same as on week days.

Capt. William Duff, of Port Clinton, has been appointed master of the schooner Montgomery, which was recently purchased from Port Huron parties by the Port Clinton Lumber Co.

The ideas that some of our young men have about the duties of war is well illustrated in the case of a member of the Naval Reserves. Ordered to prepare for active service this sailor bold, among the necessary things that he thought proper to take with him, packed his dress suit.

The steamer Mohawk broke all previous records by taking two cargoes of copper from Portage Lake during the month of April. She cleared for Buffalo with her first cargo on April 19 and cleared again on the 29th with her second cargo of copper. Copper shipments will be heavy as the mines and smelters have unusually large stocks on hand for this season of the year.

During the month of April the shipments of iron ore from the head of the lakes amounted to 133,565 tons. Of this amount the Iron Range docks at Two Harbors shipped 121,785 tons, and the Missabe docks 11,780 tons. The Missabe docks shipped only one cargo in April last year, while the shipments from Two Harbors are vastly greater than in any previous April.

Capt. Wm. Wheatley, keeper of the Marquette light, put out in Lake Superior Saturday afternoon, with Will Brandon, for a sail. Near Little Presque Isle a squall overturned the boat. Brandon swam ashore, over 1,000 feet, but Wheatley did not dare to try it, fearing camp from the icy water, and remained on the boat, which drifted out of sight. The boat was found later, drifting toward the shore, but Wheatley had disappeared. He has been given up for lost.

A stirring poem on Cuba, by Joaquin Miller, opens the May number of Frank Leslie's popular monthly. If there are any Americans who do not wish the freedom of the Cubans, a reading of this poem will quickly bring them into line. This magazine contains much of great timely interest. "Naval Warfare of To-day" is an elaborate article, giving the most complete and best illustrated description of this much talked-of topic that has yet appeared. It is written by Fred. Stone Daniel, and is accompanied by

more than twenty-five half-tone cuts of all the leading warships in our navy, including a beautiful water-color frontispiece of the battleship Maine, recently destroyed in Havana harbor. Galveston the "Island City" of Texas, comes in for an exhaustive and profusely illustrated article by Charles T. Logan; and the United States Consul at Martinique describes the City of St. Pierre.

The most prominent naval hero of today, full of common sense and good judgment, wrote as follows January 5th 1891: "I have made a careful examination of the Standard automatic releasing device, tested on board the Fortune at sea, and think it not only the best device of the kind, but the simplest and most reliable I have ever seen, and would recommend that it is adopted on board all sea going and other vessels." Thus wrote Com. George Dewey, the hero of Manila. The editor of the MARINE RECORD was similarly impressed with the device and took occasion to so state to a number of vessel owners a few years ago when the inventor of the hook and manager of the company, Capt. James R. Raymond, visited the lake ports. For a self detaching hook on the lower block of a boat's davit tackle falls we recommend corresponding with the Standard, of 22 State street, New York.

A sailor jumped overboard in the bay the other day, relates the New York Times, because the captain refused him a drink of whiskey. When the soaked and half-frozen son of Neptune was hauled back aboard his ship, the "old man" poured three large drinks of gin down his throat. After that Jack went about his business perfectly satisfied. The incident was not at all uncommon. There is nothing Jack will not do to get a drink. Once upon a time a sailor aboard the Chicago, then flagship of the North Atlantic squadron, was seized with a jumping toothache. There was no dentist aboard the ship, but the doctor after nearly killing the poor fellow, got the tooth out. Then he poured a huge drink of brandy down the half-fainting seaman's throat. Next morning at sick call fourteen seamen reported to the doctor with toothache. But alas! the doctor cured them without whiskey by a generous display of appalling surgical instruments.

THAT YUKON-ALASKA COUNTRY.

That Alaska country is perhaps not all that it is painted to be as the following letter to the RECORD from Capt. J. C. Holmes, formerly of Port Huron, clearly indicates:

"I arrived here after many trials and tribulations, and of course find Alaska is a greatly over-estimated country, but still I am one of the fortunate ones. The day after I arrived here there was a stampede to Quincy Creek, which I took in, and located claim No. 21, and it has panned me out over \$30 per day ever since, and the further I go down the more the gold is to my expectations. Provisions are high, but I am on good terms with Captain Healy, of the North American Traffic and Transportation Co., I am therefore living in hopes of getting enough pork and beans. A meal here costs \$8.50.

"The whole country is overrun by sharpers, who buy any old claim, and when they get a few together, send them out to gull the poor unsuspecting American into buying them out at a fabulous price. Many of these claims which are sent out have not been prospected, and are not worth the paper the grant is given on.

Many of the boys have expressed their intention of coming out here. Tell them for their own sake and that of their families to stay at home, as their chances of success here are infinitesimally small. There is only one in about five thousand who come out here that ever make a living. They have to be hustlers, to have a world-wide experience, and sometimes even then they will get left. Alaska is, in fact, a damn fool's country.

"Mr. Harry A. Raser was fished out of the ice recently. He was carried down the river by a sudden overflow, and came near being crushed, but a crowd of us got together and fished him out. The people here insist on giving me credit for the whole performance, but I can assure you I was scared as much as Raser or any other man. Mr. Raser is a brother to George B. Raser, manager of Hanna's docks in Ashtabula, O., and we have become quick chums, talking about Ashtabula and its famous inhabitants. Next mail, I will let you know everything I find out."

THE SUBMARINE BOAT ARGONAUT.

Press dispatches have given a brief description of this wonderful invention, but the following from the Shipping World, London, is the best account yet published. The wonders of this "Yankee notion" have been noised abroad for some time past. Of the many submarine boats designed, she is the one that has come most nearly to success. She is, be it observed, intended for the arts of peace alone; she is quite free from any thought of covertly disabling an enemy's fleet. Her aim in life is to convey divers to sunken wrecks, and to assist in any sort of salvage and subaqueous work. Mr. Simon Lake, of Baltimore, is her inventor. Her hull, 36 feet long by 9 feet in diameter, is built of plating laid over angle iron frames, measuring 3 inches by 3½ inches by ½ inch, and is divided into four compartments—the engine and living room, the air-lock, the diver's room and the look-out compartment. The first of this is the largest, and contains a gasoline engine and dynamo to drive the propeller shaft. The engine is used when the boat is traveling at the surface, and the dynamo may be disconnected from it and used as a motor when she is submerged. There are two sets of storage batteries in lockers at the sides of the boat. Where the bottom is suitable the wheels will be used, being propelled by means of the forward motor. This living room, which can accommodate six men, is provided with an air-compressor and storage tanks, to supply the divers as well as to re-

new the vitiated air. When the boat is submerged to a moderate depth air is conveyed through the two pipe-like masts, which also locate her. At greater depths these are closed and a suctionhose is used, whilst at still greater depths the storage tanks, which can supply the crew for forty-eight hours, will be relied upon.

When a diver leaves the boat he first of all enters the air-lock, forward of the living-room. The air pressure is raised to that of the divers' room, which is maintained at the pressure of the water without; the pressure in the living-room is, of course, about normal. He then passes through another door into the divers' room, which contains everything he needs for wrecking operations. When fully equipped, he opens a door in the floor and goes forth to his work, the air pressure of the compartment preventing the ingress of the water. The foremost compartment, with its powerful search-light, etc., is the pilot house, whence the vessel is steered when submerged, instead of from the conning-tower used when on the surface. Trim and buoyancy are secured by a fixed keel for two-thirds of the vessel's length, and easily operated water tanks in the floor. Weighted anchors assist in keeping the boat stationary at the desired level. The intentions of the inventor were successfully realized in the Petasco river on December 17. The Argonaut first made a short "dive" to show how quickly it could be done, and then she spent nearly five hours below with twelve persons inside her. She traversed some two miles of the river's bed, and a diver left her through the floor door. Since then she has run out eight miles of telephone wire in Baltimore harbor and conversed with New York.

EASTERN FREIGHT REPORT.

Messrs. Funch, Edye & Co., New York, send the MARINE RECORD the following report on eastern freights:

The tendency of the freight market since our last report has continued strongly upward, the rise in freights being concurrent with a very heavy advance in cereals, establishing beyond question the fact that Europe is inclined to regard the development of our war with Spain as likely to interfere with the undisturbed shipment of bread-stuffs—to be guarded against by earliest possible transmission of cargoes. Under this predicament freights for near-by and safe May tonnage have continued to advance, and have reached the 5s. mark to Cork f. o., with freights for large vessels for picked ports comparatively less advanced, especially under a proportion of oats added to heavy grain. So far little has been accomplished beyond May loading; the fixtures made for June proving that owners, as well as charterers, consider a substantial reduction under May rates as likely to prevail. The great advance for berth freights has stimulated the demand for time boats suitable to the Atlantic trade, and resulted in a number of fixtures. Engagements for other trades, in view of the overwhelming demand for grain tonnage, have naturally been light only—charterers generally expecting a reaction in freights as soon as the rush for grain becomes less pressing.

The market for sail tonnage is in an almost unprecedented condition, in consequence of the commencement of hostilities between this country and Spain. Shippers will not take American vessels, and, as the foreign flags are exceedingly scarce, chartering of sailing vessels is almost paralyzed. Occasionally high rates are being offered, principally for South America, while in other directions the political situation is not so much of a factor, although generally a very fine tone prevails, and, from all appearances, we may expect a further advance in rates.

LUBRICATION OF GAS ENGINE CYLINDERS.

The proper lubrication of gas engine cylinders has been a very difficult problem. The problem, however, seems to have been very successfully solved by an official of the Pennsylvania Railroad Co. He writes as follows:

"I had a gas engine at Sharon, Pa., running a pump, and the man that had charge of it allowed the lubricator to run dry and cut the piston, piston rings and cylinder. The makers of the gas engine said the cylinder would have to be sent to the shop and bored out and a new piston put in. It was our busy season and we could not do without water. I had some of Dixon's finely pulverized graphite, and I commenced to feed it into the cylinder through the suction pipe with the air and gas with immediate relief. After about two weeks the engine was running smoother and using less gas than ever before.

"I had this same engine apart last Saturday, and every place that was cut is smooth as glass. This one instance saved us about \$75.00. I have great faith in this graphite and always keep it on hand."

FRANKLIN D. LOCKE, of Buffalo, and H. D. Goulder, of Cleveland, appeared before Judge Coxe, of the United States District Court, of northern New York, held in Ithaca on Thursday last. They represented the Lehigh Valley Transportation Co. in a suit for \$50,000 damages against the owners of the steamer Livingston. The Grand Traverse, a steamer belonging to the company, was sunk in Lake Erie in 1896 in a collision with the Livingston. The owners of the sunken cargo had sued for \$15,000. The attorneys who appeared for the defendant were C. E. Kremer, of Chicago, and F. H. Canfield, of Detroit. The case was argued, the point involved resting upon conflicting evidence as to whether the Livingston carried proper signals. The court adjourned after a two days' session and reserved its decision. The case was of special importance, inasmuch as Judge Coxe held the court in the College of Law of Cornell university, instead of at the court house, in order to give the law students some practical work in admiralty.

WATER LEVELS OF THE GREAT LAKES.

Much interest has been manifested from time to time relative to the fluctuation of water levels on the Great Lakes. The cycle theory of maximum and minimum depths obtained for quite a length of time, and other theories have also been advanced.

It is frequently stated that the water in the several lakes must have decreased, as it is found more difficult to enter the several harbors and navigate the channels. Interested persons have remarked that the deepening of some of the channels lying between the chain of lakes has caused a drainage and lowering of the water in the lakes; others, that the wearing away of the crest of the rock at Niagara Falls has lowered the water above that point.

In making these and similar assertions and statements, these persons seem to overlook the fact that the vessels used now are larger, and draw from 6 to 10 feet more water than they did some few years ago, and, consequently, require a corresponding greater depth of channel and harbor accommodation.

The late Gen. Poe, Lieutenant-Colonel, Corps of Engineers, United States Army, in charge of the lake district for the government, writing upon this subject, stated:

"There is no indication anywhere that the waters in the lakes have mysteriously fallen. The long continued series of observation available, show that since 1838 the water level has fluctuated within limits somewhat less than 6 feet, and that these fluctuations were due to the greater or less rain and snowfall. It may be considered as a fact established, that the lakes are simply great pools forming part of the course of a river, and that they conform to all the laws governing the rise and fall of rivers."

In 1881 it was stated by the Toronto newspapers that the level of Lake Ontario had been lowered by work done at the Galops rapids in the St. Lawrence river, and that the harbor at Toronto had been damaged by it. It was proved, however, that thirty years before the deepening of the Galops channel was begun, the water was as low in Lake Ontario as it was in 1881.

The best authorities on hydraulics show that no harm can result from deepening the several channels, for it is a theory of permanent motion that a change of regimen being made at any point of a river, its effect is extended up and down stream, decreasing as it goes until points are reached where it disappears entirely and the river remains unaffected.

The elevation of the mean surface of the lakes above mean sea level is as follows:

Lake Ontario.....	246 6-10 feet.
Lake Erie	572 9-10 "
Lakes Huron and Michigan.....	581 3-10 "
Lake Superior	601 8-10 "

The difference of 20½ feet between Lakes Superior and Huron occurs in the rapids of St. Mary's river; the 84-10 feet between Lakes Huron and Erie mainly in Detroit river.

The difference of 326 feet between Lakes Erie and Ontario occurs in the vicinity of Niagara Falls, and is principally assembled as follows: 100 feet in the 5 miles of rapids between Lewiston and the lower suspension bridge, 10 feet in the rapids between the bridge and the falls, 160 feet at the falls, 50 feet in the rapids, immediately above the falls, and 6 feet in the upper Niagara river.

The mean depth of Lake Superior is about 475 feet; the deepest point marks a depth of 1,008 feet, or 406 feet below the level of the sea. Lake Michigan has a mean depth of 325 feet, and a maximum depth of 870 feet, or 289 feet below sea level. Lake Huron has a mean depth of 250 feet and a maximum depth of 750 feet, or 169 feet below sea level. Lake Erie is comparatively shallow, having an average depth of less than 70 feet and a maximum of 210 feet, being 363 feet above sea level. Lake Ontario has a mean depth of about 300 feet and a maximum of 738 feet, or nearly 500 feet below the level of the sea. The channel of the rivers connecting the lakes seldom exceeds the depth of 50 feet. If the lakes could be drained to the level of the sea, Lake Erie would disappear, Lake Huron be reduced to quite insignificant dimensions, Lake Michigan to a length of about 100 miles, with a width of 25 or 30 miles, Lake Ontario and Superior, though with diminished areas, would still preserve the dignity of their present titles as Great Lakes.

The volume of water in the lakes is about 6,000 cubic miles, of which Lake Superior contains a little less than one-half. Perhaps a better idea of this volume may be obtained when it is said that it would sustain Niagara Falls in its present condition for about 100 years.

From the Crosman chart it is noted that the average discharge of water at the several points on the lakes is as follows: St. Mary's river 86,000 cubic feet per second; St. Clair

river 225,000; Niagara river 265,000; and the St. Lawrence river 300,000 cubic feet per second.

The principal changes in the elevation of the lake surface are those due to the wind and to rainfall.

During protracted autumn gales, waves have been observed which, through reliable means, measured from fifteen to eighteen feet above the normal surface.

The second class of variation are those due to rainfall, as before stated.

The last ten years show a tendency to irregularities which may be due to changes in rainfall and water-shed, produced by the rapid destruction of forests which, some years ago, covered the basin of the upper lakes.

Observations made by the United States survey have established the existence of small tides which, at Chicago, had an amplitude of 1½ inches for the neap tide and about 3 inches for the spring tide.

There is still another class of oscillations called seiches, which have been already observed in the Swiss lakes, and for which a solution, in all respects satisfactory, has not been offered. Whenever the lakes are sufficiently free from the disturbing action of wind to permit observation, a quite regular series of small waves, or pulsations, can be detected, which have an interval of about ten minutes from impulse to impulse. These pulsations seem to occur almost without cessation on Lake Superior. Besides having tides in common with the ocean, the lakes have well defined land and lake breezes, the breeze from the lakes landward, commencing in summer at 8 or 10 o'clock a. m., and continuing until sunset, and the breeze from the land lakeward from 9 or 10 p. m. until sunrise.

As we have said various theories have been advanced to account for the several changes in the water level of the lakes. It is, however, well established that the fluctuations are due to the variations in rainfall, as the lake levels approximate closely to those of rainfall and snow. The highest known level occurred in 1838, when Michigan and Huron rose 26 inches above ordinary high stage, and Erie and Ontario 18 inches. The lowest level was in 1819, when Erie fell 3½ feet below its usual plane. Since the highest water in 1838 there have been alternate periods of descension and ascension of the levels.

While there is every reason to believe that a winter of continually freezing weather, by retaining the snowfall until the thawing weather of April or May, will tend to raise the summer level of the lake at the expense of the winter level, it is not confirmed to any great degree. The explanation of this is not difficult. A single week of warm weather in the winter, causing the melting of the greater part of the snow, might be preceded and followed by extremely cold weather, giving a low mean temperature for the month; so that a cold winter does not necessarily imply the impounding until spring, in the form of snow, of the winter rainfall.

For about one-half the distance across the continent the waters of the St. Lawrence system divide the Dominion of Canada from the United States. The boundary line, beginning on the St. Lawrence in latitude 45 degrees, passes through the middle of Lakes Ontario, Erie, St. Clair, Huron, the St. Mary's river and Lake Superior, to a point on its north shore 124 miles east of Duluth and Superior, the western end of Lake Superior. Lake Michigan is wholly within the territory of the United States.

These Great Lakes contain more than one-half the area of all the fresh water of the globe. They make up the largest system of deep water inland navigation on the globe.

No other inland water may bear upon its bosom so vast a commerce, or touches, as this does, the vital interests of so many millions of men.

Lying, in general direction, east and west between the 41st and 49th parallels, of latitude, they penetrate the tide water on the St. Lawrence.

The western extremity of the system, the head of Lake Superior is 1,700 miles only from the waters of the Pacific, 2,384 miles from Belle Isle, at the mouth of the St. Lawrence, and 4,618 miles from Liverpool.

The range of this water system, it will be observed, is entirely within the limits of the north temperate zone, on the line on which population has most freely moved westward, where final settlement is most compact, and where climatic conditions insure the largest returns to capital and labor. Lake Superior, the head of the system, alone receives the waters of 200 rivers.

One hundred and fifty miles northwest of Port Arthur and Duluth are the fountains of three of the great drainage systems of the continent. Physical conditions there send flowing waters northward to the ocean through Hudson Bay;

southward, through the Mississippi valley and the Gulf of Mexico, and eastward through the lakes and the St. Lawrence. For commercial purposes, the northern drainage system has not yet been utilized; but flowing water will forever be a potent instrument of commerce, southward and eastward, between the interior and the Atlantic coast.

Such are the peculiar and the favoring physical conditions under which two great peoples of English tongue occupy, side by side, the North American continent from ocean to ocean, using in common this continental waterway, and by treaty stipulations interchanging with each other the use of improvements inside their respective boundary lines.

From both sides then of this continental boundary line, inevitably and forever will come here for transit into the world's commerce, the products of the vast plains and the mountain region of the far Northwest.

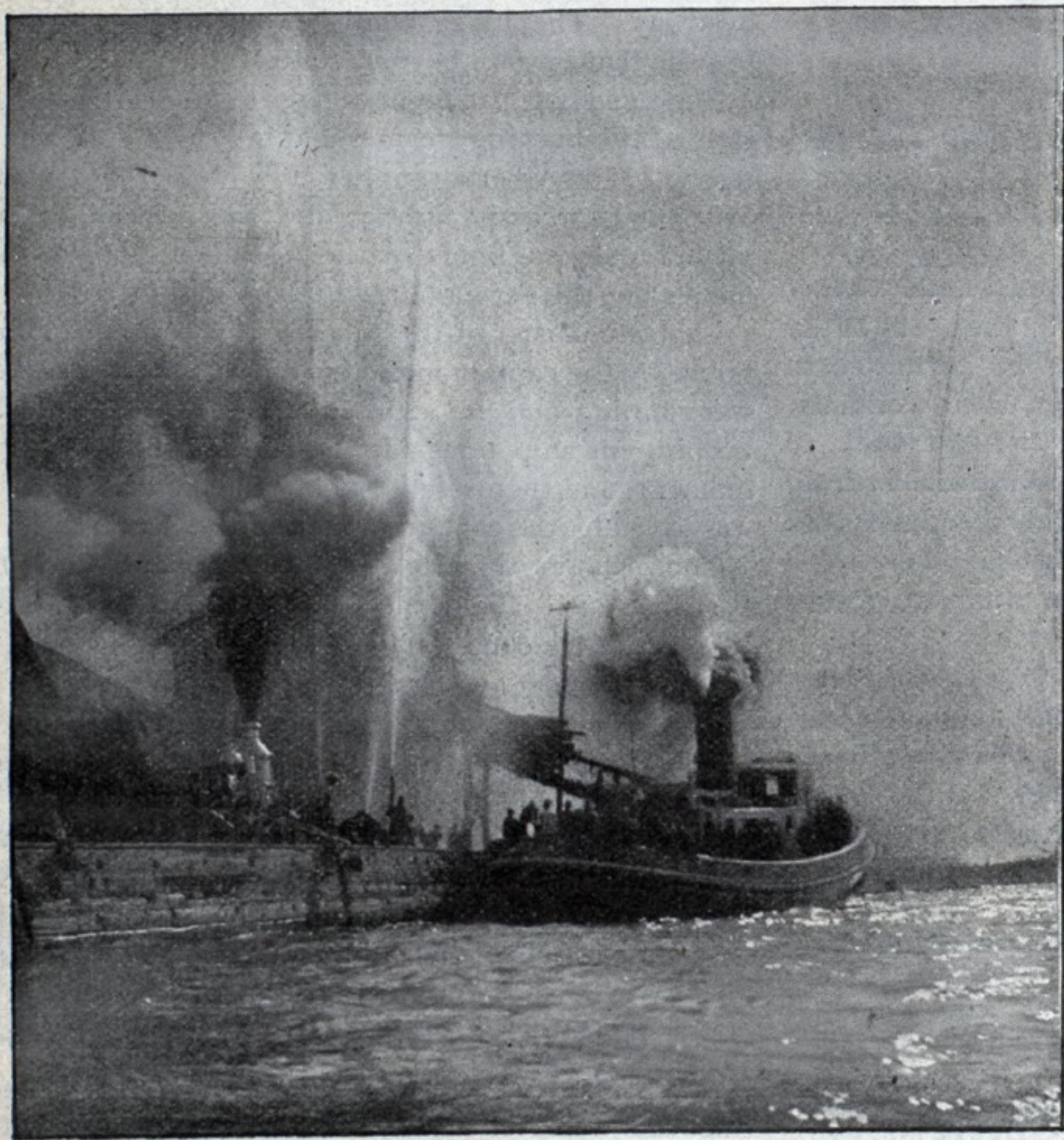
On this line also, to a large extent, will be made the commercial exchanges of the Pacific Slope, Australia, China and Japan.

MARITIME LAW.

Two decisions have been handed down by the United States Circuit Court of Appeals in admiralty cases which will be of general interest to the shipping community. One of these was in the suits of the Merritt Wrecking Co. against the International Navigation Co. for salvage on the St. Paul, when she was stranded about two years ago on the coast of New Jersey, and the other in the suit of Atlas line against the French liner La Bourgogne, which was in collision with the Ailsa in the lower bay in February, 1896, as a result of which the latter vessel was sunk. In both cases the higher court affirmed the decision of the District Court. That court in the case of the St. Paul awarded salvage of \$131,012.48 against the vessel and \$28,987.52 against the cargo. It was contended by the American line on appeal that too large an amount was awarded for salvage, and that it was with one exception the largest reported in the books. The Court of Appeals held on this point that "the value of the property salvaged was very greatly in excess of any reported in the books, and while it is true that the percentage of award diminishes as the amount salvaged increases, no case can be found which does not sustain the proposition that the amount salvaged is an important element to be considered in determining the amount to be awarded." "About \$1,000,000 of the cargo," continued the court in part, "was gold, contained in twenty-one kegs. The intervenors to whom it was consigned insist that salvors should recover only \$100, because the gold was conveniently stowed, easily handled, its discharge into the lighter occupying only one hour, and because it paid a high rate of freights. *** The weight of authority is decidedly against differentiating the awards against different kinds of cargo or relieving specie from bearing its share of the common burden when it is not removed to a place of safety before salvaging operations are begun." The case involved really two suits: One against the International Navigation Co., and the other against that company and Crossman and others as intervenors. The decrees of the District Court, as just stated were affirmed, with interest and costs in the first, and with neither interest nor costs in the second, both sides having appealed.

The claims in the case of the Ailsa were substantially as follows: On the part of the Ailsa it is claimed that the collision arose by the fault of the Bourgogne (1) in not anchoring before passing Fort Lafayette and in unnecessarily coming below the fort in thick fog, (2) for excessive speed in fog, and (3) for not having a proper lookout and not giving proper signals. For the Bourgogne it was claimed that the Ailsa was alone to blame for (1) having anchored unnecessarily in the channelway, where vessels seeking anchorage must be expected to pass, (2) for not giving the statutory signals, and (3) for not letting out her cable when the approach of the Bourgogne was seen. Judge Shipman, in handing down the decision of the higher court, says in part: The question in regard to the Bourgogne's speed and her not having a proper lookout, and her not giving proper signals, and in regard to the Ailsa's not giving the statutory signals may be laid out of the case. The evidence is that each vessel did her duty and complied with the statutes in these particulars. The two important questions in the case are whether the Ailsa was anchored in the channelway to the westward of the prescribed anchorage limits, and whether the Bourgogne was guilty of negligence in not having sooner understood the importance of coming to anchor and in not anchoring above Fort Lafayette. Judge Brown has given, with great care, the testimony in regard to

the navigation of the Ailsa and the deductions from it which assisted him to a result which freed the Bourgogne from liability. * * * The Ailsa knew the importance of coming to anchor, and says that she left the mid-channel and that she attempted to be out of the way of vessels proceeding through the Narrows. The Bourgogne says that she left the mid-channel under the same necessity for the purpose of anchoring in the bay below Fort Lafayette. Each knew the importance of keeping out of the way of moving vessels, and each knew that for the purpose of safety in the crowded harbor of New York, anchorage grounds had been provided, but that in the darkness it was difficult to know with certainty where they were, and therefore each knew the necessity of caution. In this position of affairs it is of some significance that no one on board the Ailsa, and no one in her behalf testified that she was on anchorage ground. Her pilot, who presumably was familiar with the anchorage lines, says: "We were on the eastern side of the channel. I could not exactly state whether we were on the inside of the line or on the line, because there was a dense fog, but we were somewhere on the line or near the line." Another circumstance is that it appears by the Ailsa's testimony that after she anchored two steamships, both going down on the eastward side of her, passed very near her. A third vessel, the Bourgogne, ran into her. This shows that she was in the pathway of similarly situated vessels who were also seeking anchorage, and that she had stopped in their way, and not outside of it." As to the alleged negligence of the Bourgogne the court held in part: Captain Poirot, of the Bourgogne, says that after his vessel entered the thick fog opposite Quarantine he wanted to anchor, but the pilot said they were too much in the Narrows, and must go south of Fort Lafayette. * * * The thickness of the fog before or as the vessel reached the Narrows, was not such as to make it imprudent to go forward until the bay was reached. Her act was not in violation of the statutory rule. * * * The pilot of the Ailsa went through the Narrows. The pilots of at least four other steamers



TOW-BOAT AMERICA AS A FIRE FIGHTER.

came to the same decision and acted accordingly. Upon the assumption that they were men of average prudence their concurrent action under like circumstances is very significant. The decrees of the District Court are affirmed with costs.

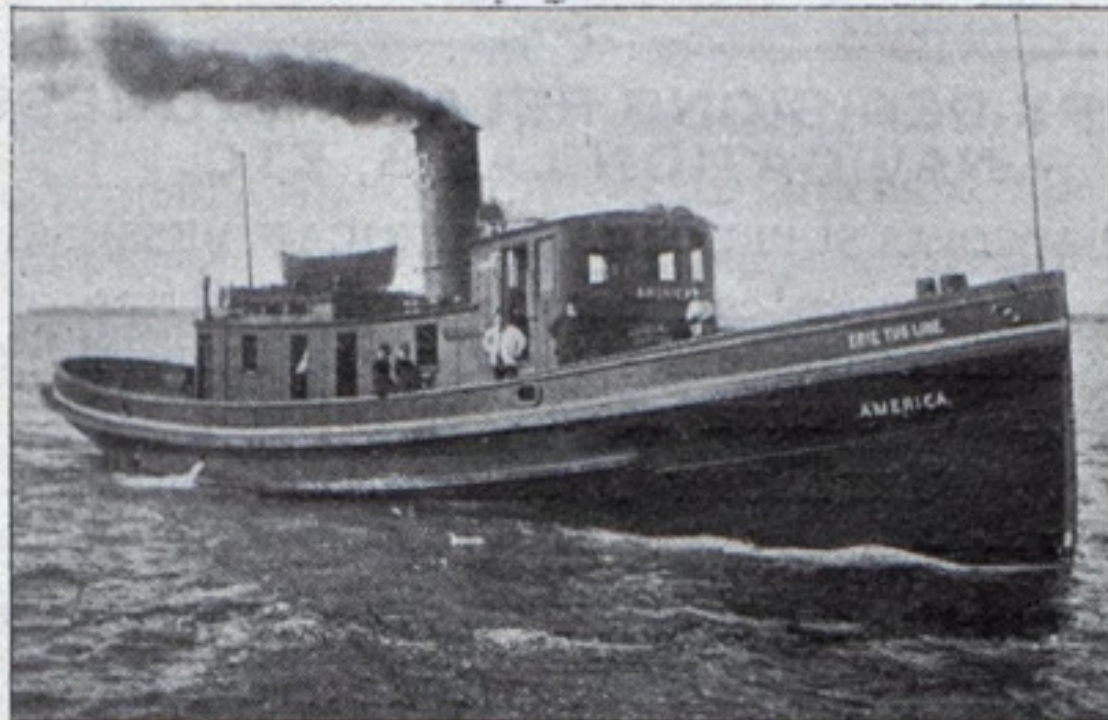
LAKE AND RAIL RATES REDUCED.

The lake and rail rate on flour from Duluth to New York will be reduced from 17 cents to 15 cents. The reduced rate will become effective on Thursday, May 5th. The new rate will mean a 20 cent rate out of Minneapolis. The reduction will also have the effect of increasing the differential between the lake and rail and the all rail lines to 5 cents. At present the differential in favor the lake and rail lines is 3 cents and many claim that it is not sufficient.

TOW-BOAT AMERICA.

(ILLUSTRATED.)

The two views herewith presented are of the steel harbor tug America, of Erie, Pa., under the management of W. H. Hill, of the Erie Tug Line. This tow-boat is under contract to the city of Erie as a fire-boat, and is one of the most powerful of the type of tugs in this country. The larger picture shows a test of her fire fighting qualities, in which



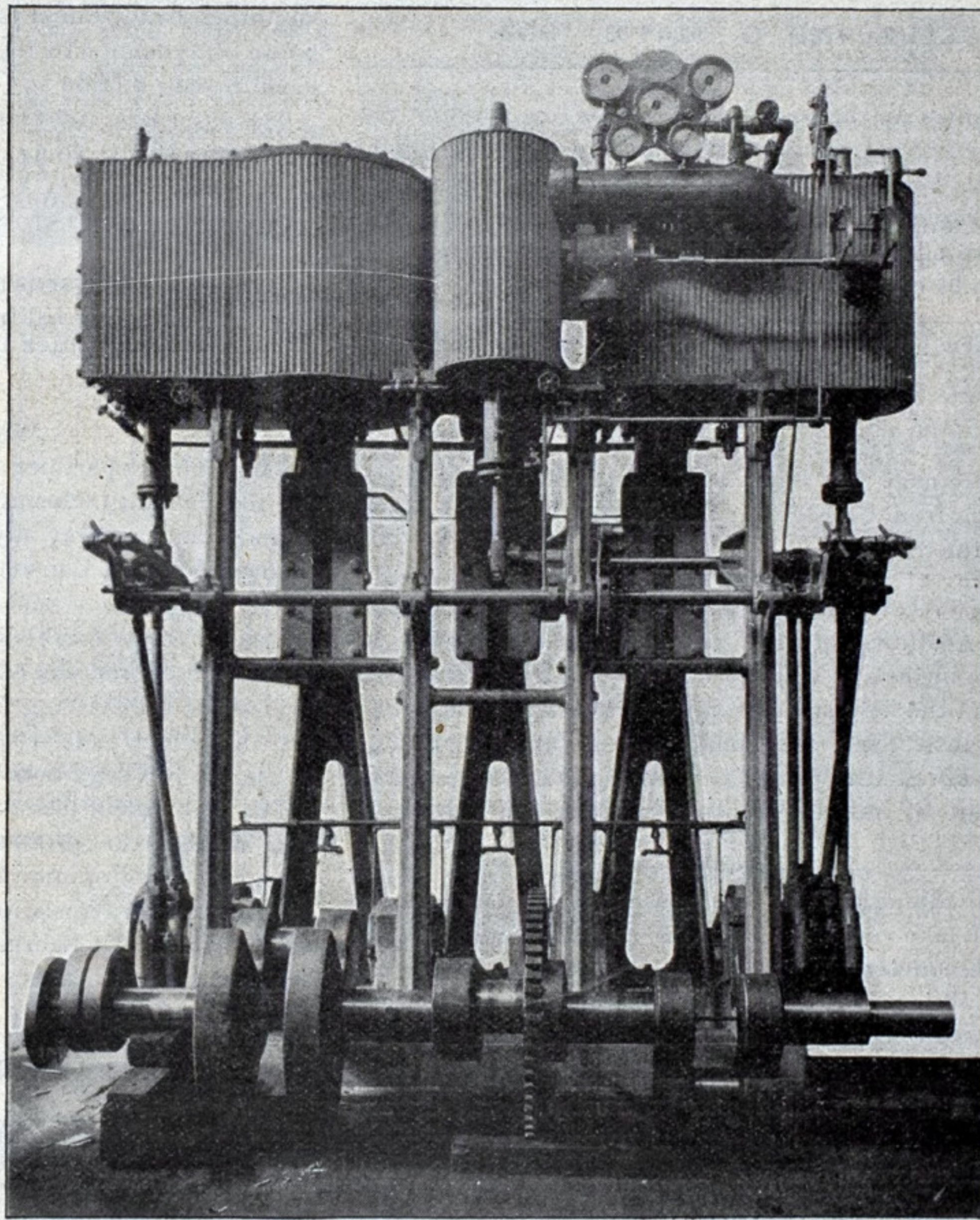
TOW-BOAT AMERICA.

she threw a stream equal to that of the two fire engines combined, which competed with her, the latter working through a Siamese pipe. These illustrations are from the 1898 edition of Beeson's Marine Directory, now in press.

ENGINES OF THE CHARLES F. DUNBAR.

(ILLUSTRATED)

The accompanying illustration shows the engine of the new tug Charles F. Dunbar, built by H. G. Trout, of Buffalo, being placed in the tug, built by the Union Dry Dock Co., at Buffalo. The boat is owned by the Maytham TugLine, of Buffalo, but is under charter to Dunbar and Sullivan, who are building the breakwater



ENGINE OF NEW TUG CHARLES F. DUNBAR.

extension at Buffalo, and is specially designed to pull heavily loaded gravelscows up the rapids at the head of Niagara river, where for about half a mile of the pull there is a nine mile current to overcome. The engine dimensions are, diameter of cylinders 16", 25" and 40" by 27" stroke, and will use upward of 200 lbs. steam pressure and is designed for fast turning. The propeller wheel is a nine foot, with a nine inch pitch and is of the cast steel, sectional type.

The annual meeting of the stockholders of the Joseph Dixon Crucible Co., was held at the company's main office, Jersey City, N. J., Monday, April 18, and out of a possible vote of 7345 shares, there were 7042 shares voted for the re-election of the old Board, consisting of Edward F. C. Young,

John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Alexander T. McGill and Joseph D. Bedle. President E. F. C. Young, Vice-Pres. and Treasurer John A. Walker, and Secretary George E. Long were re-elected by the Directors. Judge Joseph D. Bedle was also re-elected as counsel.

RECORD OF WRECKS AND CASUALTIES SINCE JANUARY 1, 1898.

(Reported by Norman B. Conger, Local Forecast Official and Marine Agent.)

January 26, 1898.—The record of disasters for the year 1898 began with the loss of the steamer City of Duluth, which stranded on the bar at the mouth of the St. Joseph river at St. Joseph, Mich., and went to pieces during a heavy sea which came on after the vessel struck. No lives were lost; the crew and passengers were rescued with some difficulty by the Life-Saving Service. Cargo, 28,000 bushels of corn and 2,000 sacks of flour; loss on vessel, \$40,000, cargo, \$15,000.

The following accidents occurred to the grain fleet in making the passage at the Straits, viz: The steamer Merida forced in her plates forward of the collision bulkhead, wetting 13,660 bushels of corn; the steamer Fayette Brown had two planks on the starboard bow stove in; the Raleigh was damaged by ice, and the schooner Ash had two planks stove in forward. The most serious damage was the sinking of the schooner Northwest, in tow of the steamer Aurora. They had encountered very little ice on the way up; the Northwest was the last in the tow and was struck by sunken ice and began to fill when about off Waughoshance. The steamer en-

deavored to tow the sinking vessel into shoal water, but was unsuccessful and the Northwest sank in 12 fathoms of water 3 miles south of west of St. Helena light and 5 miles from McGulpin Point. The vessel was laden with 76,600 bushels of corn for Buffalo. Estimated value of vessel, \$22,000; cargo, \$30,000; the crew were taken off by the steamer Aurora. The loss of the schooner Northwest recalls the early movement of the grain fleet from Chicago in 1894 and the loss of the steamer Minneapolis on April 4, by coming in contact with the ice fields in the Straits. The Northwest was lost on April 6, two days later in the season than the Minneapolis.

The Sailor's Magazine, 76 Wall street, New York, for May contains a most interesting and valuable article under the title "What Shall be Done for Our Sailors," by John K. Paulding.



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CLEVELAND, O., MAY 5, 1898.

JUST to finish up the week's work, as on the previous Saturday, there was a 3,000-ton craft launched from the Davidson yards at West Bay City, and two more to follow. An important launch each Saturday afternoon from one shipyard is a precedent in industrial discipline and activity, for it all has to be counted on beforehand.

THEY knew how to put vessels together on the lakes half a century ago, and to build them so as to keep built; also, to sail them, as the following legend from the "Inland Lloyd's Vessel Register" seems to prove: "Schooner Norman, net tonnage 239, built at Sacketts Harbor, N. Y., in 1848, hailing from Chicago." The Norman is on her second letter and rated B†

Two cargo records have been made this week. The steel tow-barge Australia, of the Corrigan Line, Cleveland, carried 210,539 bushels of wheat, or 6,316 tons, from Chicago to Buffalo; and the new steel steamer Andrew Carnegie, of the Wilson Transit Line, Cleveland, 230,000 bushels or 6,440 tons corn from South Chicago to Owen Sound, Georgian Bay, for shipment by rail to Montreal and thence across the Atlantic.

SEVERAL attempts have been made to furnish a season crew list of lake vessels in so far as masters, engineers and mates were concerned. It has been found, however, that each week brings about so many changes that any lists made out would not be accurate for a single day, much less for the whole season. Officers do not always join the vessel even after being appointed, nor go aboard, or rather leave port, after being shipped, so that it is impossible to keep a correct partial crew list, of the names of masters and engineers sailing in each boat.

LAKE FREIGHTS.

Grain freights have again been the "best bower" this week, as last, but at slightly weaker figures, shading from 1¼ cents on wheat to 1¾ cents, to Buffalo. All available tonnage was placed on Wednesday at 1¼ cents on corn; 2¾ cents to 3 cents, Kingston.

A 20 cent rate on coal, Lakes Michigan or Superior, was generally quoted, though it was thought easy to get 25 cents. There is a feeling that at least thirty cents should be paid to Lake Michigan and a strenuous effort is being made to force the rate up to that figure. On the other hand just as great an effort has developed to beat coal rates down to 15 cents, Lake Michigan, and at this a number of owners talk about making a mutual arrangement not to carry coal at any such a money losing figure and it is likely that some combination may be brought around so that owners and coal shippers may know just what they are doing in handling coal for the

leading ports. A block of coal was offered at 25 cents, June to December, Milwaukee, at 25 cents.

There is a lot of tonnage chartered to carry ore, but shippers are in no particular hurry to move it just yet and the boats are engaged in the grain trade and taking coal west for ballast. An Escanaba charter for steamer and tow barges was closed Wednesday, Escanaba to Ohio ports, 40 cents, but the market is more than dull and the best class of tonnage is depending on grain cargoes.

TREASURY DECISIONS RELATING TO VESSELS, NAVIGATION LAWS, ETC.

TOBACCO AS SUPPLIES TO AMERICAN VESSELS.

Manufactured tobacco can not be furnished free of tax as supplies to American vessels otherwise than under provisions of section 16, act of July 24, 1897.

TREASURY DEPARTMENT, April 21, 1898.

SIR: The department is in receipt of your letter of the 18th instant, relative to the request of Messrs. A. & L. Weiss for permission to furnish manufactured tobacco free of tax as supplies to American vessels otherwise than under the provisions of section 16 of the act of July 24, 1897.

The applicants represent that there are only three bonded manufacturing warehouses from which tobacco may be withdrawn for supplies under said act, and that none of these warehouses will sell in quantities less than 800 to 900 pounds, while ships never take more than 200 to 250 pounds.

It is understood that in order to obviate this difficulty the applicants desire that tobacco withdrawn under internal revenue laws for exportation without payment of tax be diverted for use as supplies.

The department concurs with you in the opinion that there is no authority of law for such evasive substitution, nor for any other arrangement than withdrawal from a bonded warehouse or a manufacturing warehouse for supplies, as provided in said section 16.

The request is, therefore, denied.

Respectfully yours,

O. L. SPAULDING, Assistant Secretary.

COLLECTOR OF CUSTOMS, New York, N. Y.

CARS TRANSPORTED IN CANADIAN VESSELS.

Cars can not be carried in Canadian vessels to Canada and brought back in other Canadian vessels.

TREASURY DEPARTMENT,
BUREAU OF NAVIGATION,
WASHINGTON, D. C., April 22, 1898.

SIR: This department is in receipt of your letter, dated the 16th instant, inclosing a request made by the agent of the Grand Trunk railway at your port that he be permitted to send to Windsor, Canada, cars which, with their contents, are to be put into a boat in Windsor and brought back to Detroit at the Wabash slip, stated to be down the river from the starting point, the object being to avoid the delay and expense of transferring the cars to the Wabash depot by a belt line which runs around the city. The company desires to use the privilege both ways.

The department has to state that, regardless of the question whether the proceeding would unduly endanger the revenue, it is of opinion that the privilege can not be allowed without further legislation, especially in view of the provisions of the act of February 17, 1898, relating to transportation in analogous cases.

Respectfully yours,

O. L. SPAULDING, Assistant Secretary.

COLLECTOR OF CUSTOMS, Detroit, Mich.

DOCUMENTS OF VESSELS.

Fractions of tons to be disregarded in documents of vessels.

TREASURY DEPARTMENT,
BUREAU OF NAVIGATION,
WASHINGTON, D. C., April 25, 1898.

SIR: This office is in receipt of your letter dated the 13th instant. You inquire:

First, will the circular of March 7, 1898, and the letter of the 6th instant relating to fractions of tons, necessitate the changing of the tonnage now carved on the main beams of vessels?

Second, will they necessitate change of tonnage in outstanding documents?

Third, whether fractions of tons should be omitted in specifying in marine documents capacity for "inclosures," etc.

Fourth, whether the present method of assessing tonnage tax on the tonnage expressed in registers is to be changed?

The questions are all answered in the negative.

The circular and the example given therein expressly limited the omissions of fractions to statements "of the capacity of the vessels admeasured," and did not in any

manner relate to statements of the capacity of separate spaces.

In making up the statement of the total capacity of a vessel, therefore, the tonnage, including fractions of tons, ascertained, of separate spaces, like the "space under the tonnage deck," "inclosures," etc., should be specified and added as heretofore in any new marine document granted on or after July 1, 1898, but the capacity of the vessel, gross and net, should appear in whole numbers only.

In view of the foregoing, it does not appear to this office that you will experience any material difficulty in complying with the instructions you mention, embodied in the bureau's letter of the 6th instant, stating the balances of tonnages at your port, and directing you to neglect fractions of tons when adding your abstracts, but not to omit the fractions from the abstracts until July 1, 1898.

Respectfully yours,

E. T. CHAMBERLAIN, Commissioner.

COLLECTOR OF CUSTOMS, San Francisco, Cal.

CARGO AS WAR PRIZES NOT SUBJECT TO DUTY.

TREASURY DEPARTMENT, April 26, 1898.

Collector of Customs, Key West, Fla.: Cargoes brought in as war prizes are not subject to duty, and go immediately into hands of United States marshal for prize court. No action on your part required.

W. B. HOWELL, Assistant Secretary.

LOSS OF THE STEAMER SERVIA.

Fire broke out on the steamer Servia on Lake Superior, about fifteen miles northwest of White Fish Point, last Thursday. She was abandoned and afterwards foundered.

The Servia, with the schooner Frank D. Ewen in tow, bound from Duluth to Kingston with a cargo of corn, sighted the steamer Argonaut flying signals of distress about thirty miles west of White Fish Point and went to her assistance. The Argonaut's machinery had broken down. The disabled steamer was taken in tow. Some three hours later fire broke out in the forward part of the Servia and gained rapid headway. The fire extinguisher and pumps were manned, but the flames were beyond control.

The Canadian Pacific passenger steamer Alberta, upbound, sighted the burning steamer and her tow and went to the rescue. The Alberta sent her crew aboard and manned her own pumps to assist fighting the fire. Heroic efforts were made for several hours by the combined crews to subdue the flames but the Servia burned to the water's edge.

Capt. McAllister, of the Alberta, is spoken of in the highest praise by the captain and crew of the Servia. A heavy sea was running and he exhibited remarkable seamanship in keeping his ship alongside the burning boat until the last moment, and then safely getting the crew aboard. Nothing was saved by the captain or men of the Servia.

The Alberta then towed the Argonaut and Ewen to Waiskai Bay. The burned boat was owned by Hawgood & Avery, of Cleveland. She was of 1,182 tons and built in 1883. The boat and cargo were worth \$120,000, both insured. She foundered in about seventy fathoms of water.

Smith, Davis & Co., Buffalo, had the insurance on the freight (probably cargo), and the hull was covered for \$70,000 in the McCurdy-Prime syndicate, Chicago. Until April 16 she was insured for \$80,000 with Smith, Davis & Co., of Buffalo. Her cargo of corn, which was shipped by the Barnum Grain Co., of Duluth, was insured for \$22,400.

CONTRACT FOR A NEW STEEL YACHT.

The Globe Iron Works Co., Cleveland, has closed a contract this week for a steel steamyacht which will be the largest and finest boat of the kind on fresh water. The new yacht will be fifteen feet longer than Mr. H. M. Hanna's yacht Comanche. She will be 200 feet over all, 186 feet keel, 25 feet beam and 17 feet deep, and will have about 1,500 horse-power. She will have triple-expansion engines and two Scotch type boilers. All the details as to the boilers and engines have not yet been arranged. Her owners want to make her as fast a boat as possible without giving up too much room for boilers and machinery. The new yacht will be too large to get through the canals to the coast and she will be fitted only for the lakes. She will not be completed, however, this season.

She is to be fitted up in elegant style, and money will not be spared to make her the finest steam yacht on the lakes. The names of her owners are withheld from publication for the present. Aside from the big schooner D. Z. Norton, which is about completed, this contract gives the Globe Iron Works Co. three vessels to work on.

THE "SOO" WEITZEL LOCK.

The Sault Ste. Marie News states that the removal of the north half of the miter sill foundation at the swing guard gate has been finished by the contractors. The other half will be taken out and the work completed within ten days. The canal employees are now engaged in overhauling the machinery and tightening the rods in the culverts of the Weitzel lock. It was discovered this spring that extensive repairs will have to be made on the lower gates of the Weitzel lock before it will be safe to operate it. It may be decided to build a new set of gates. These gates have been used ever since the completion of the lock, in 1881, and are virtually worn out, particularly the lower ones. Some of the tie rods have pulled into the heel and toe posts; others have been broken by the strain; still others are slack and some unusually tight. With this condition of things the force of the water has caused the gates to bulge in on the upper side and bulge out on the opposite surface, making it hazardous to attempt to use them. Supt. Ripley says it would be best to construct new gates, but does not know whether this will be done, or whether the gates will be repaired. The question is now being considered by Col. Lydecker. It would require about three weeks to repair the gates and about six weeks to build new ones. Sufficient timber is on hand for the purpose and the most of the work on the old gates could be utilized in the new ones. Supt. Ripley says it is the intention to employ a portion of the Weitzel lock force in operating the Poe lock and to use the other portion in repairing the former lock and repairing or building new gates. He is of the opinion that the traffic through the canal will not require the operation of the Weitzel lock for some time yet.

SUBMARINE LANDSCAPES.

Prof. Louis Boutan, of the Sorbonne, writes an article for May Century describing his successful experiments in "Submarine Photography." Prof. Boutan says:

I soon found out that the bottom of the sea, especially near the coast, is not flat and monotonous, as one might imagine it to be. On the contrary, it is very uneven, and presents most picturesque and varied landscapes. If one happens to have descended on a sandy beach, one sees, as far as the eye can reach, a submarine meadow covered with long grasses, all bent over in the direction in which the current is running. Here and there deep ravines cut up the green surface, while farther away are noticed steep masses of rock formed by fallen blocks or stony precipices. Every boulder is covered with its dress of seaweed, and in the crevices between swarm a whole fauna of invertebrates.

The strangeness of these submarine landscapes made a very deep impression on me, and it seemed a lamentable fact that they could not be reproduced in any other way than in a description which, however exact, was necessarily imperfect. I was filled with the desire, therefore, to bring back from these submarine explorations a more tangible souvenir. But, however good a diver one may be, it is scarcely possible to make a drawing, or even a sketch, under water. I then resolved to try to see if I could not obtain a photograph of this hidden region. As it is not difficult to take a landscape in the open air, why, I asked myself, could I not succeed in making a photograph at the bottom of the sea? Though it is quite certain that water is a much denser medium than air, still, as the eye can distinguish objects in the midst of water, there should be, I argued, no insuperable obstacle in the way of a photographic plate receiving an impression under the same conditions.

CHANGE THEIR PORT OF HAIL.

Hereafter the fleet of the Northern Steamship Co. will hail from Duluth instead of Superior, and about 24,000 net tons will be added to the registered tonnage of that port.

It is expected that there will be other lines added to the list in the near future. It is not improbable that the registered tonnage of the port of Duluth will be doubled during the present year. The Northern Steamship Co. was attracted to Duluth for enrolling its vessels by reason of the favorable vessel taxation laws of the State of Minnesota.

The good results of the law are made more apparent every year. Next July three additional Bessemer boats will be enrolled. The three boats will swell the registered tonnage of the port to the extent of 20,500 tons.

The favorable effect of the present vessel taxation law of Minnesota is made more evident by comparison with the past when the laws were not so favorable. Before the enacting of the present law the registered tonnage of the port of Duluth amounted to 1,556 net tons. That was in 1893. This insignificant tonnage was represented by harbor tugs

and other small craft to the number of 44 and represented the entire taxable vessel property of the port. In 1897 the number of vessels enrolled had jumped to 113, and the net tonnage to 74,130.87 tons. During the present year the enrollment has amounted to about 30,000 tons, and there is assurance of more than 20,000 tons more.

With other fleets in prospect it is not improbable, therefore, that by next year the registered tonnage of Duluth will be pushed up to 140,000 or 150,000 net tons.

A GOOD AND SAFE PORT.

Mr. Geo. J. Harris, general western agent of the Canada Atlantic Transit Co., with offices at Chicago, has received a letter from Capt. John Massey, of the steamer Linn, expressing his opinion of the harbor at Parry Sound, as follows:

PARRY SOUND, APRIL 25, 1898.

Mr. G. J. Harris, Chicago, Ill.

DEAR SIR: I arrived in Parry Sound, Saturday night, at 7 p. m., all O. K. I found no difficulty coming into this harbor drawing 18 feet of water. We came nearly all the way full speed, and it is the finest harbor I ever saw. It is land locked all around and there is lots of water. They are going to put a gas buoy on the Sequin Banks, just outside of Red Rock light, and another one about half way in, on a 14-foot spot that is in nearly the mid-channel and then this will be a good place to come to. It is a far better place than Midland.

Yours respectfully,

(Signed) JOHN MASSEY.

ASHTABULA COMMERCE.

The port of Ashtabula shows a surprising amount of shipments and receipts for the month of April. The Daily Beacon prints the arrivals and clearances as follows: The month just passed has shown a marked improvement over the same period last season, which opened one of the best seasons ever had here. The ore receipts at this port in 1897 shattered all previous records, but at the same time not a pound of ore was received until May 4, when the steamer Cambria arrived from Escanaba. This year starts out with the same steamer discharging an ore cargo at the docks in the month of April and during that month 55,862 tons of iron ore were brought to this port. The shipments of coal during the last month were almost exceptionally good, as the following table will show:

April, 1898.		Coal shipped.
Official.....	47,733 tons	
Unofficial.....	46,451 "	
Foreign.....	4,983 "	
Total.....	99,167 tons	
April, 1897.		Coal shipped.
Official.....	28,370 tons	
Unofficial.....	14,501 "	
Foreign.....	2,201 "	
Total.....	45,092 tons	

An increase of 1898 over 1897 of 54,075 tons, or more than double the amount. It might be explained that under the head of unofficial appears the records of boats and cargoes that do not have to be recorded at the custom house, having officially arrived or cleared at some other port in the same district, but through the faithfulness of Collector Richardson authentic records are secured. The arrivals and departures were:

April 1898.		Arrived.	Departed.
Official.....	37	55	
Unofficial.....	44	38	
Foreign.....	2	3	
Total.....	83	93	

The Western Transit Co. shipped 631 tons of merchandise during April.

GRAIN AT DULUTH.

The shipments of all kinds of grain from the port of Duluth for the month of April amounted to 5,110,439 bushels. The shipments consisted of 1,743,357 bushels of wheat, 876,272 bushels of corn, 903,686 bushels of oats, 914,707 bushels of rye, 227,241 bushels of barley, and 345,176 bushels of flax. It is said that there are between 3,000,000 and 4,000,000 bushels of grain subject to charter in the elevators at the head of the lakes at the present time.

The receipts of grain at the head of the lakes for the month of April amounted to 3,130,034 bushels. It was divided as follows: Wheat, 1,517,475 bushels; corn, 98,122 bushels; oats, 1,024,828 bushels; rye, 189,568 bushels; barley, 31,736 bushels; flax, 268,305 bushels.

The stock of wheat in store at the close business last Saturday night consisted of 3,063,850 bushels. The total decrease in wheat stocks for the month of April amounted to only 165,975 bushels. Wheat receipts for the week ending April 30 amounted to 552,602 bushels, and the shipments to 604,459 bushels.

NOTES.

THE steel lake tug Fischer, of the Lake Michigan Car Ferry Transportation Co., will be inspected at South Chicago by government officials with a view of sending her to the coast.

"THE American Navy," is the name of a publication, part first of which the MARINE RECORD has received from Bedford, Middlebrook & Co., publishers, Chicago. The number contains full page photo engravings of 16 battleships of the United States Navy, including the Maine, with introduction and descriptive matter. It is published weekly at \$25 a year or 50 cents a number. The Navy numbers are very fine and ought to find a liberal sale.

THE Bethlehem Iron Co., South Bethlehem, Pa., have just issued a finely illustrated pamphlet of fifty-five pages on the "Fatigue of Metal in Wrought Iron and Steel Forgings" by Mr. H. F. J. Porter and published from advance sheets of the Journal of the Franklin Institute where the subject is freely discussed. The Bethlehem Iron Co., will be pleased to send copies of this exceedingly valuable pamphlet on application to their office.

A story current during the civil war, bears a repetition now that Uncle Sam again has his war paint on. In a certain Methodist church where a revival was in progress, the repentant were urged to come forward to the anxious seat. "Will no one volunteer?" asked the preacher, after waiting a moment in vain for the sinners to come forward, "will no one volunteer?" There was absolute silence for a few seconds, when a deep voice from the gallery awoke the congregation by "draft 'em, damn it, parson, draft 'em."

THE firm of James L. Robertson & Sons, of 214 Fulton street, New York, has been dissolved and two new firms organized, viz.: James L. Robertson & Son, who will give their attention to the sale of Eureka, Fairmount square flax, and all other packings; Hine eliminators, steam separators and oil extractors, engineer and mill supplies. The Robertson Manufacturing Company, who will make a specialty of manufacturing indicators and their attachments, together with feed-water heaters, grate bars, exhaust heads, damper regulators and other mechanical steam specialties. The main object of this change is to afford Mr. James L. Robertson a well-earned rest from the exacting details of a constantly increasing business.

THE United States seem to take as naturally to water as a cat takes to cream. Six months ago we didn't know a cruiser from a gunboat, and now we are nautical to the top notch. We talk boats, we think boats. We have pictures of boats all over our daily papers; boats decorate our magazines, boats cover our billboards. We fight naval battles with gravy boats, and sail cracker boats in wastes of steamy soup. Even our bottines have the shape of boats, and an eastern observer claims we are exhibiting an increased taste for salt. In short, we are subject to a violent sea change, and the old Norse blood is asserting itself within our somewhat sluggish veins. The mere pigmies of the land, the crawling infantry, the hoppity, kickity cavalry, the trundling artillery, are for the moment set aside. It is the sailor lad with his rolling gait, the bully of the after deck, the captain in his conning tower, who hold our hearts' affection. The gorgeous galaxy of generals may bedizen themselves as they will; it is the admiral on the bridge who catches the admiring eye of an adoring public.

This is a great nation; it can adapt itself to either of the ruling elements.

And it's a holy terror on both.—Cleveland Plain Dealer.

WHAT is described as the "largest engine of its type ever built," is to develop 10,000 horse-power and drive the excursion paddle steamer "Empress Queen" from Liverpool to the Isle of Man, the steamer being 360 feet over all. This engine is a three-cylinder compound, diagonal type, surface condensing. The high-pressure cylinder, sixty-eight inches in diameter, is placed between two low-pressure cylinders of ninety-two inches diameter each, and with a stroke of eighty-four inches length; the high-pressure cylinder has a piston valve, while the other cylinders have flat side valves, the double eccentric link motion controlling all three. The starting and reversing is done by means of a direct-acting steam and hydraulic engine; the condenser, cylindrical in form, is placed athwartships between the cylinders and the shafting supports, and a separate centrifugal circulating pump, worked by an independent steam pump, supplies the condensing water and is arranged to be used as a bilge pump if necessary. Two boilers are installed forward of the engine and two aft, making two compartments. The Fairfield Shipbuilding and Engineering Company, of Govan, Scotland, are the builders, and the "Empress Queen" is expected to make twenty-five statute miles an hour.

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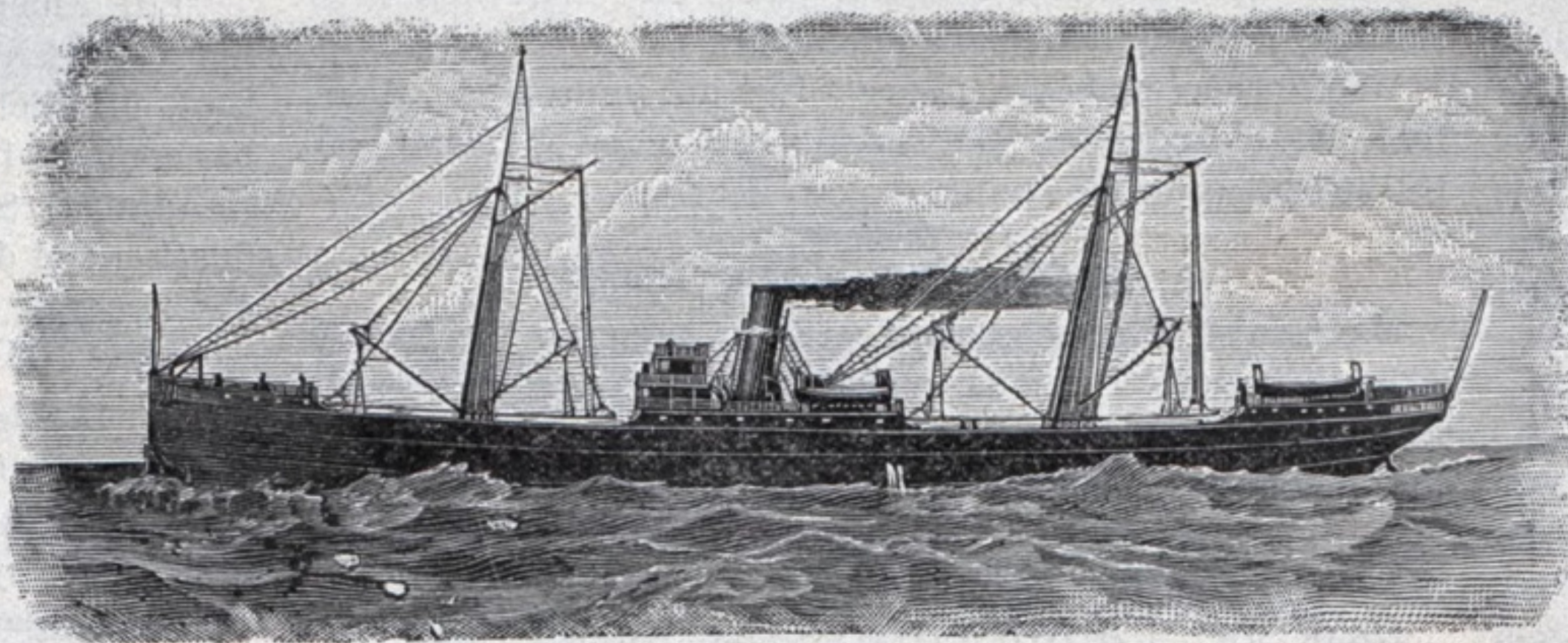
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WIND-BAROMETER TABLE FOR THE GREAT LAKES.

(BY PROF. E. B. GARRIOTT, WEATHER BUREAU.)

HEIGHT OF BAROMETER (LAKE LEVEL.)	DIRECTION OF WIND.	CHARACTER OF WEATHER AND WIND INDICATED.
29.40 to 29.60, and steady	West.....	Fair, slight changes in temperature, gentle to fresh winds.
29.40 to 29.60, rising....	West.....	Fair, cooler, fresh west to northwest winds.
29.40 to 29.60, falling....	South.....	Warmer, increasing southerly winds.
29.60, or above, falling rapidly	East to South..	Warmer, rain or snow within 36 hours, increasing east to southeast winds.
29.60, or above, rising rapidly	West to North..	Cool and clear, quickly followed by warmer, variable winds.
29.60, or above, steady...	Variable	No immediate change, but winds will go to south inside of 36 hours.
29.40, or below, falling slowly	South to East...	Rain or snow, increasing easterly winds.
29.40, or below, falling rapidly	South to East...	Rain or snow, high easterly winds, followed within 48 hours by clearing, cooler, west to northwest winds.
29.40, or below, rising slowly	South to West..	Clearing, colder, fresh to brisk west to northwest winds.
29.20, or below, falling rapidly	South to East...	Severe storm of wind and rain, and wind shifting to northwest within 36 hours.
29.20, or below, falling rapidly	East to North..	Severe northeaster, with heavy rain or snow, and winds backing to north-west.
29.20, or below, rising rapidly	Goingt o West..	Clearing and Cooler, probably cold wave in winter.

COMMERCE AND THE RIGHT OF SEARCH.

The Law Journal, of London, publishes the following: "The event of a war between the United States and Spain and the effect upon commerce, is a matter which has excited some attention.

"One result of the outbreak of war would be that either belligerent would have the right to search any vessel upon the high sea to ascertain its nationality and the nature of the cargo on board. Resistance to the right of search, according to the rule which has been emphatically affirmed in the British Prize Courts, renders the ship liable to condemnation.

"The United States and Spain are not parties to the Declaration of Paris. Consequently they are not bound by the rule that the neutral flag covers the cargo. Therefore, a British ship carrying a cargo belonging to either belligerent could be taken by a ship of the other belligerent to a convenient port for the purpose of having the cargo condemned. Under such circumstances the usage is for the captor to pay freight to the captured ship.

"Goods which are contraband of war, destined for the use of the enemy, are liable to confiscation, and freight is not allowed in respect of them to the carrier. The carriage of contraband goods does not, however, according to the prize law of most countries, render the ship liable to any other penalty in the absence of fraud or other aggravating circumstances. There are dicta in one or two English cases that when the ship-owner is privy to the carriage of contraband goods his ship is liable to condemnation; but there is no English or American case in which such a principle has been clearly established.

"A ship which violates an effective blockade is, together with the cargo intended for the blockaded port, liable to capture.

"It is, however, clearly established by English law, trade in contraband goods or to a blockaded port is lawful for a British subject when this country is neutral. Therefore, a charter made by a British ship-owner for the purpose of running a blockade could not be repudiated by him. On the other hand, performance of a contract to carry goods to a

port, which before the loading, becomes blockaded, is excused when the charter contains an exception of restraints of Princes. And even without this exception, the ship-owner would, it is thought, not be bound to carry out his contract, on the ground that the adventure had been frustrated by circumstances not contemplated when the contract was made.

"The question is a more difficult one if in the course of the voyage the port of destination should become blockaded. If the cargo owner requires delivery at a port where the ship has put in. The *Teutonia*, 41 Law J. Rep. Ad. 4 is an authority for saying that he must pay freight. If the ship-owner calls on him to take delivery elsewhere than at the port of destination, it has been held that he does not by accepting the cargo, become liable to pay any freight (*Castel v. Trechman*, 1 C. & E., 276). If the cargo owner absolutely refuses to take delivery elsewhere, it seems probable on the scanty authorities dealing with this point, that the shipowner must keep the cargo until it is possible to deliver it, unless the charter contains the usual clause for delivery 'as near thereto as she can safely get,' and it is possible to discharge the cargo at some place near to the blockaded port.

"Contracts of insurance made in this country would not, from the legal point of view, be much affected by a war between two foreign states. Insurances on the property of belligerents would be valid, unless, as was the common practice in maritime wars, a warranty of neutrality were inserted in the policy; but unless the character of the property were disclosed, the policy might be avoided on the ground of concealment. It follows from the fact that trade in contraband goods or to a blockaded port would, by English law, be lawful, that an insurance on such goods on such a voyage would be good. But the nature of the cargo or of the voyage would aggravate the risk, and would therefore have to be disclosed."

THE HEAVENS FOR MAY.

Astronomical data for May, 1898, furnished the *MARINE RECORD* by the Washburn Observatory, Madison, Wis. Mercury has just passed inferior conjunction and become a morning star. It reaches greatest elevation west on May 28, and will be favorably situated for visibility the latter part of the month. Venus is the brilliant evening star seen low in the west and setting a little north of where the sun goes down. Its brightness is increasing. Mars rises near the

east point of the horizon from 3:30 to 2:20 a. m. Jupiter is the brightest star of the evening sky, and crosses the meridian from 9:30 to 7:30 p. m. Saturn is low in the southeastern sky, and rises from 9:15 to 7 p. m.

The times of sunrise and sunset for the month at Milwaukee, are as follows:

	SUNRISE.	SUNSET.
May 1.....	4:45.....	6:53.....
May 11.....	4:32.....	7:04.....
May 21.....	4:22.....	7:14.....
May 31.....	4:15.....	7:23.....

The times of the moon's phases are:

Full moon.....	May 5.....	12:34 p. m.
Third quarter.....	May 12.....	3:36 p. m.
New moon.....	May 20.....	6:58 a. m.
First quarter.....	May 28.....	11:14 a. m.

The principal fixed stars visible during the month are: To the west: Capella, Castor and Pollux, Procyon and Regulus. To the east: Spira and Arcturus.

VISIBLE SUPPLY OF GRAIN

As compiled for The Marine Record, by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY. Bushels.
Buffalo.....	1,025,000	815,000	1,337,000	357,000	204,000
Chicago.....	3,327,000	11,431,000	818,000	233,000	108,000
Detroit.....	34,000	196,000	7,000	13,000	.....
Duluth and Superior	3,064,000	2,533,000	3,176,000	656,000	106,000
Milwaukee.....	58,000	.....	1,000	27,000	.....
Montreal.....	234,000	64,000	1,152,000	61,000	44,000
Oswego.....	.....	95,000	.....	.....	.....
Toledo.....	426,000	471,000	313,000	11,000	.....
Toronto.....	18,000	.....	21,000	.....	6,000
On Canal.....	.....	.....	46,000	.....	.....
Grand Total.....	23,263,000	27,044,000	11,218,000	2,830,000	841,000
Corresponding Date, 1897.....	34,412,000	16,997,000	11,722,000	3,195,000	2,294,000
Decrease.....	2,651,000	4,605,000	557,000	30,000	53,000

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

SUN'S AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation. A second bearing may be taken by compass at sunset by reversing the east bearings given for the nearest latitude, as the change in declination for a few hours makes but a slight difference in the true bearing of the Sun's setting:

LAKE ERIE AND S. END LAKE MICHIGAN, LAT. 42° N.		
Sunrise.	Bearing.	Bearing.
May 7.....	E. 21° N.	E. by N. 7/8 N.
May 11.....	E. 23° N.	E. N. E.
May 15.....	E. 26° N.	N. E. by E. 3/4 E.

LAKE ONTARIO, S. END HURON AND CENTRAL PORTION LAKE MICHIGAN, LAT. 44° N.		
Sunrise.	Bearing.	Bearing.
May 7.....	E. 21° N.	E. by N. 7/8 N.
May 11.....	E. 25° N.	N. E. by E. 3/4 E.
May 15.....	E. 26° N.	N. E. by E. 3/4 E.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.		
Sunrise.	Bearing.	Bearing.
May 7.....	E. 23° N.	E. N. E.
May 11.....	E. 25° N.	N. E. by E. 3/4 E.
May 15.....	E. 27° N.	N. E. by E. 3/4 E.

LAKE SUPERIOR, LAT. 48° N.		
Sunrise.	Bearing.	Bearing.
May 7.....	E. 24° N.	N. E. by E. 7/8 E.
May 11.....	E. 27° N.	N. E. by E. 3/4 E.
May 15.....	E. 27° N.	N. E. by E. 3/4 E.

With a compass correct magnetic, the difference between the observed and true bearing or amplitude will be the variation for the locality. Should there be any deviation on the course the vessel is heading at the time of taking the bearing, the difference between the observed and the true amplitude after the variation is applied, will be the amount of deviation on that course. If the correct magnetic bearing is to the right of the compass bearing, the deviation is easterly, if to the left, the deviation is westerly.

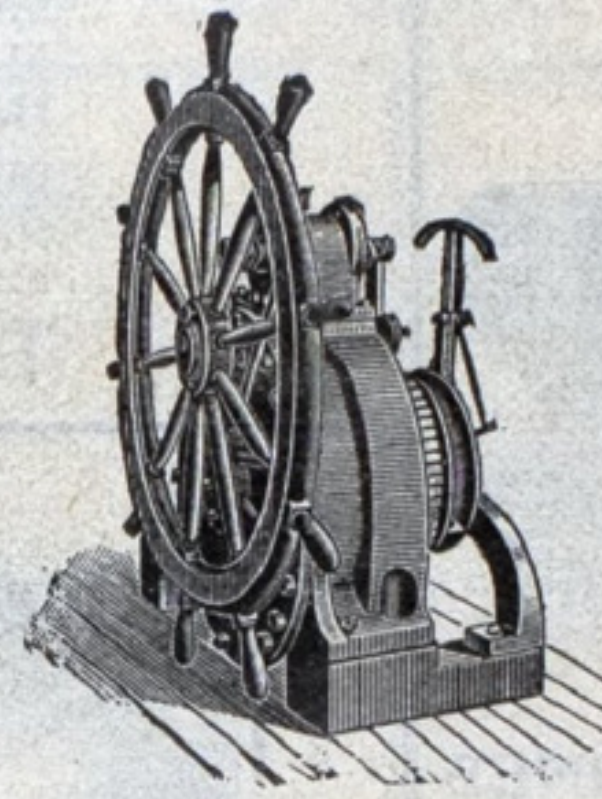
OPENING OF NAVIGATION.

April 15, 1898.—Interlake navigation opened this season much earlier than usual. The Straits of Mackinac were free of ice on March 28, the earliest date but one during the sixty-three years that records have been kept. The Straits again filled with ice with the shifting of the wind but vessels

were able to work their passage through, the majority taking the north passage as the south channel was filled with solid pack ice until the second week in April. The first of the grain fleet left Chicago on the afternoon of April 1, and arrived at Buffalo on April 4, the steamer Yale being the first to leave Chicago and arrive at Buffalo. The steamer Fred Pabst was the first boat of the season to pass the Straits, bound down at 4:15 P. M., April 2, followed by the Wm. Wolf at 4:25 P. M. of the same date. The first boat bound up was the Pine Lake, at 2 P. M., April 3, followed by the Byron Whittaker at 4:20 P. M. The grain fleet experienced very little difficulty from ice except in passing through the Straits, the lakes being remarkably free of ice for the season of the year. The passage into Green Bay was forced on April 11 by the Ann Arbor No. 1, in making Gladstone harbor. The steamers Lockwood and Norfolk were delayed several days by ice after getting into the bay.

The steamer City of Paris arrived at Sault Ste. Marie on April 14 and passed through the canal, opening navigation into Lake Superior. The steamer W. D. Rees left Duluth for Washburn on April 11 and experienced considerable difficulty in working through the ice after reaching the bay.

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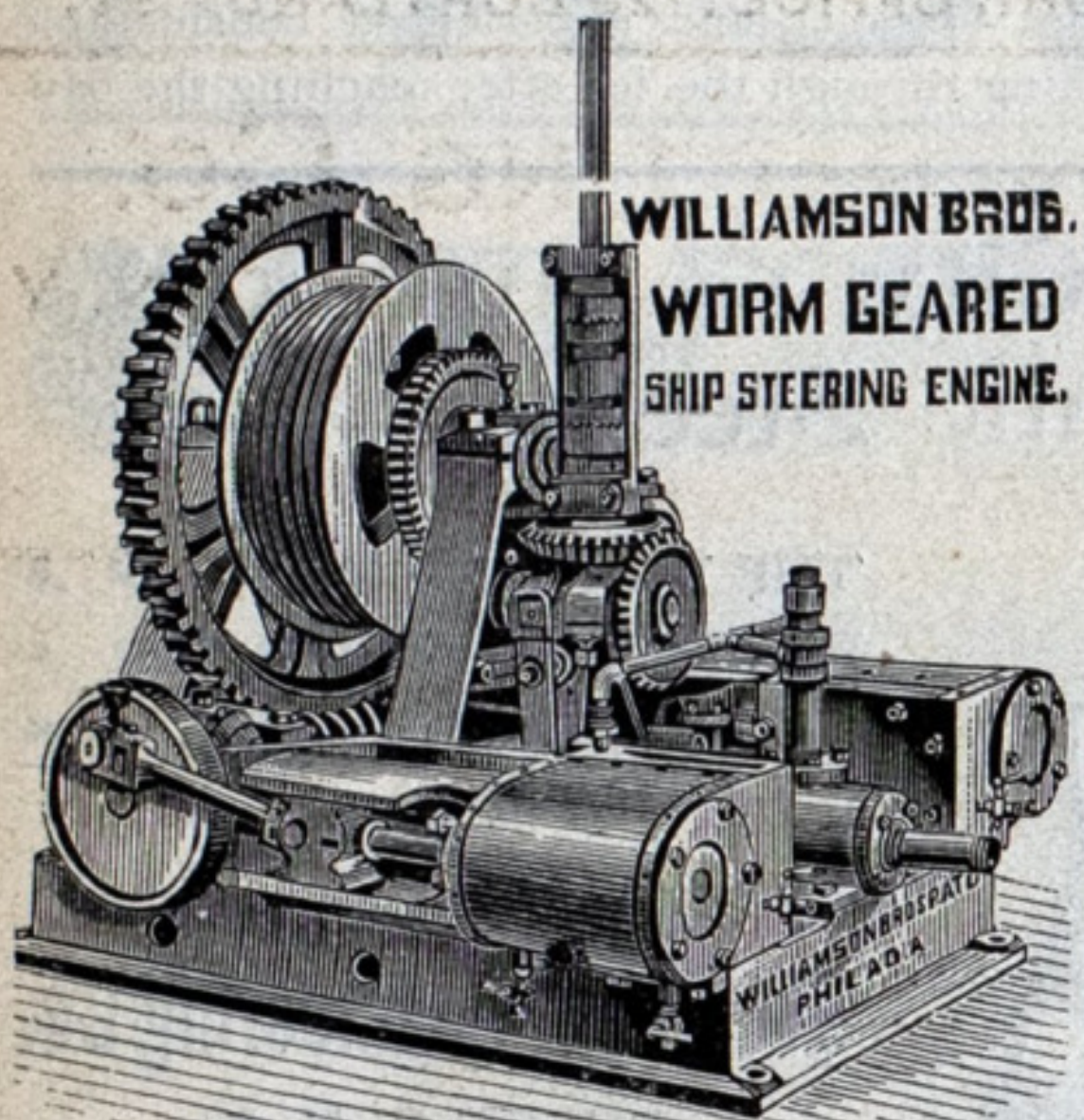
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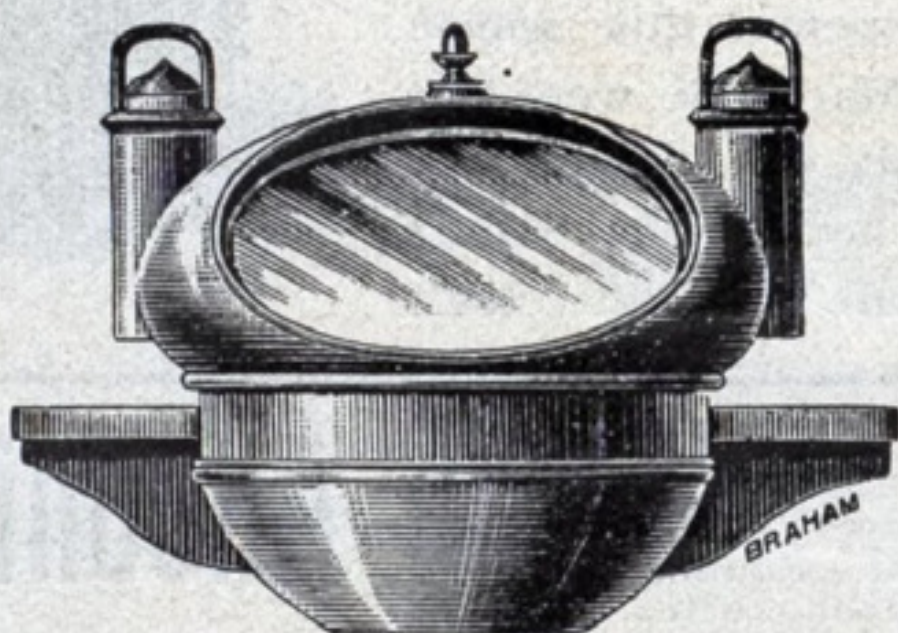
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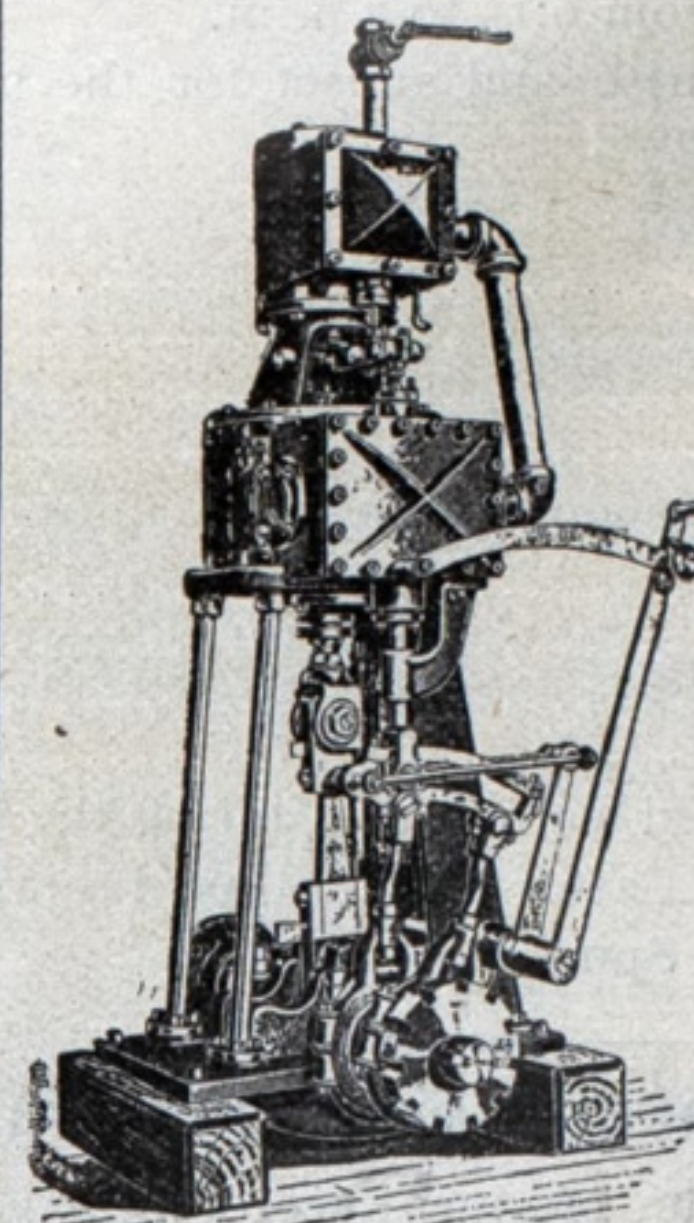
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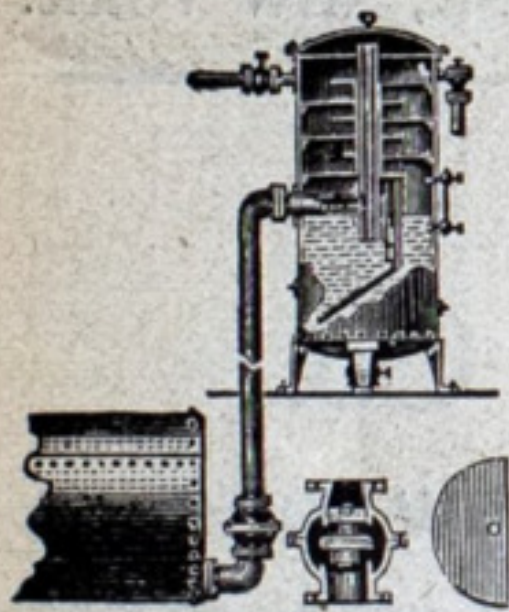
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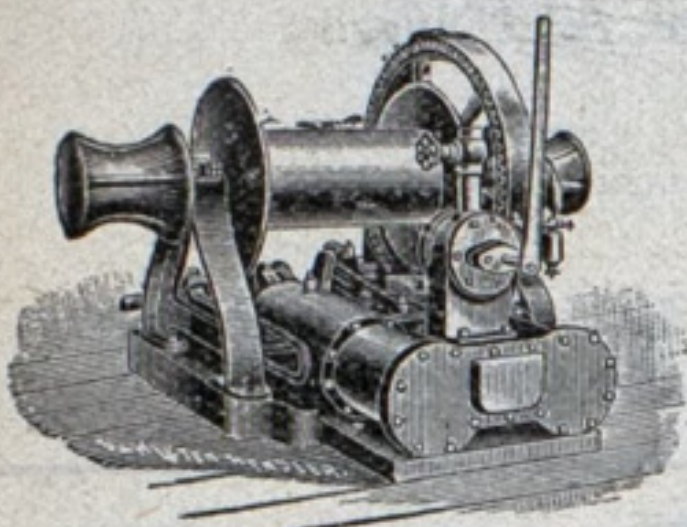
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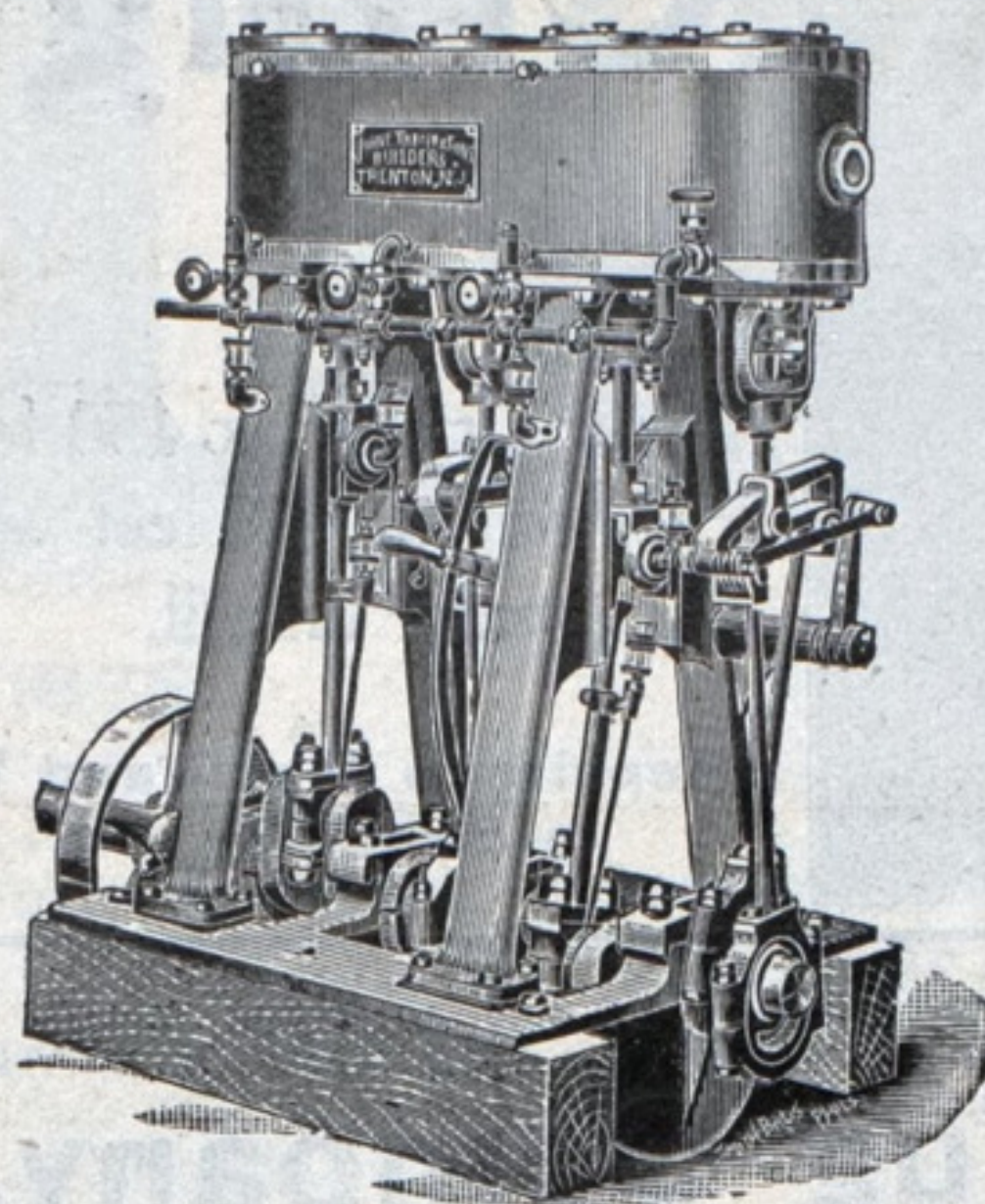
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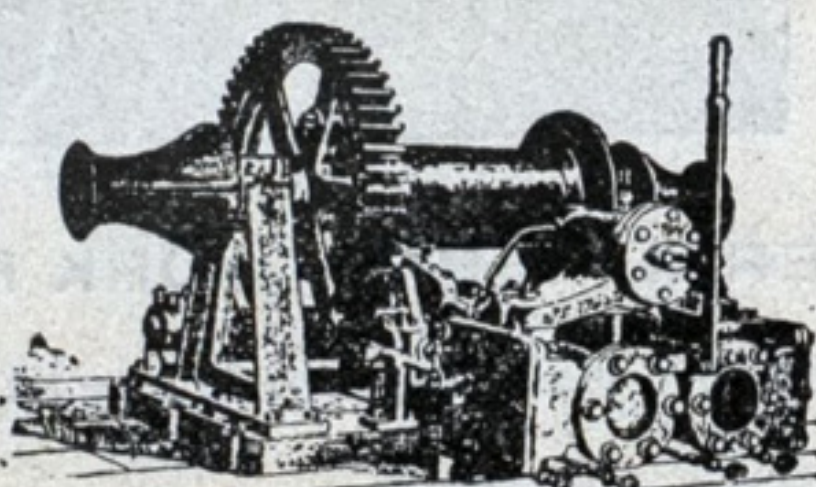
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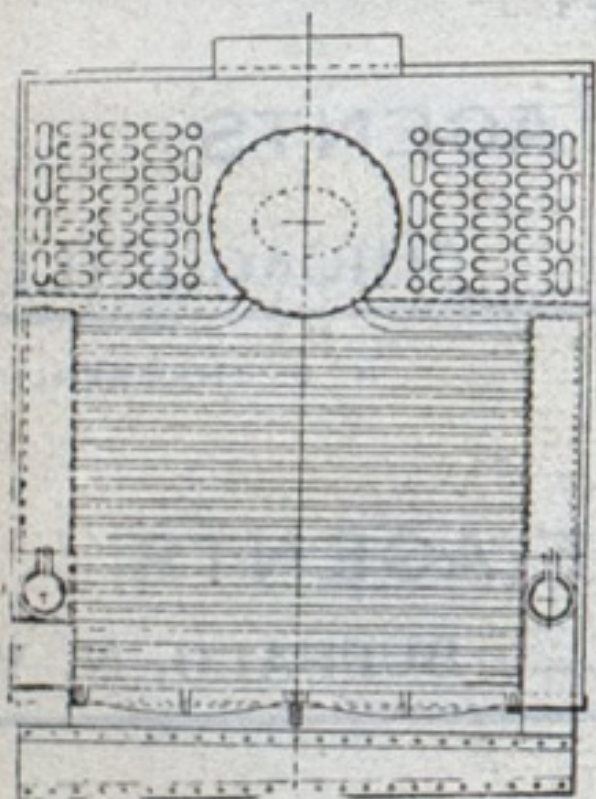
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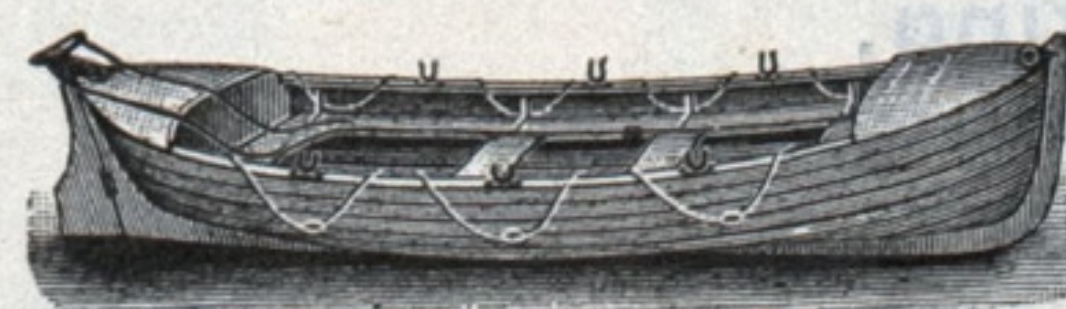
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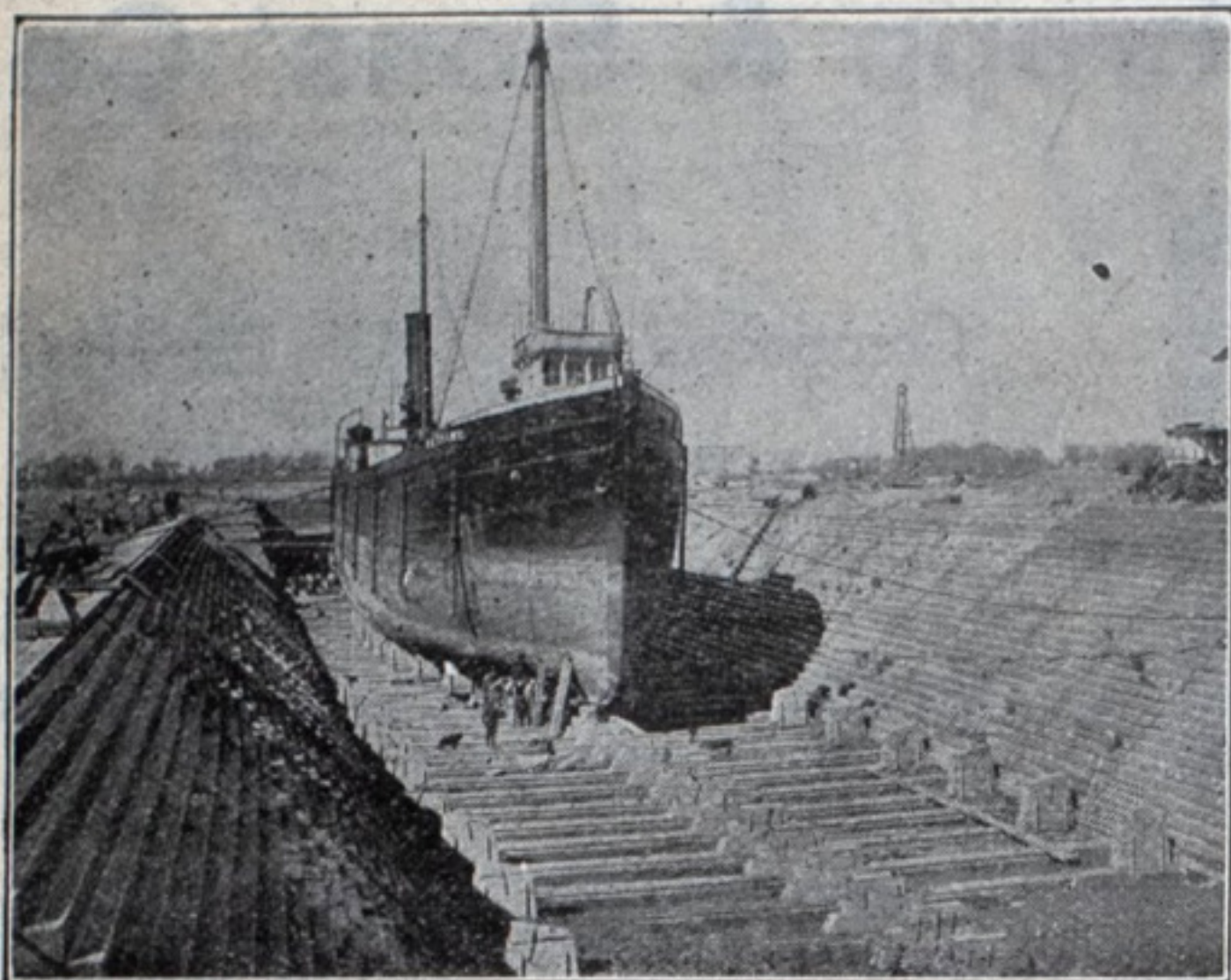
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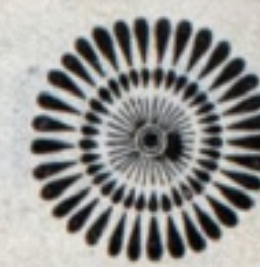
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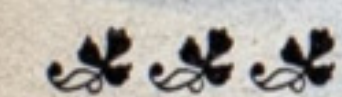
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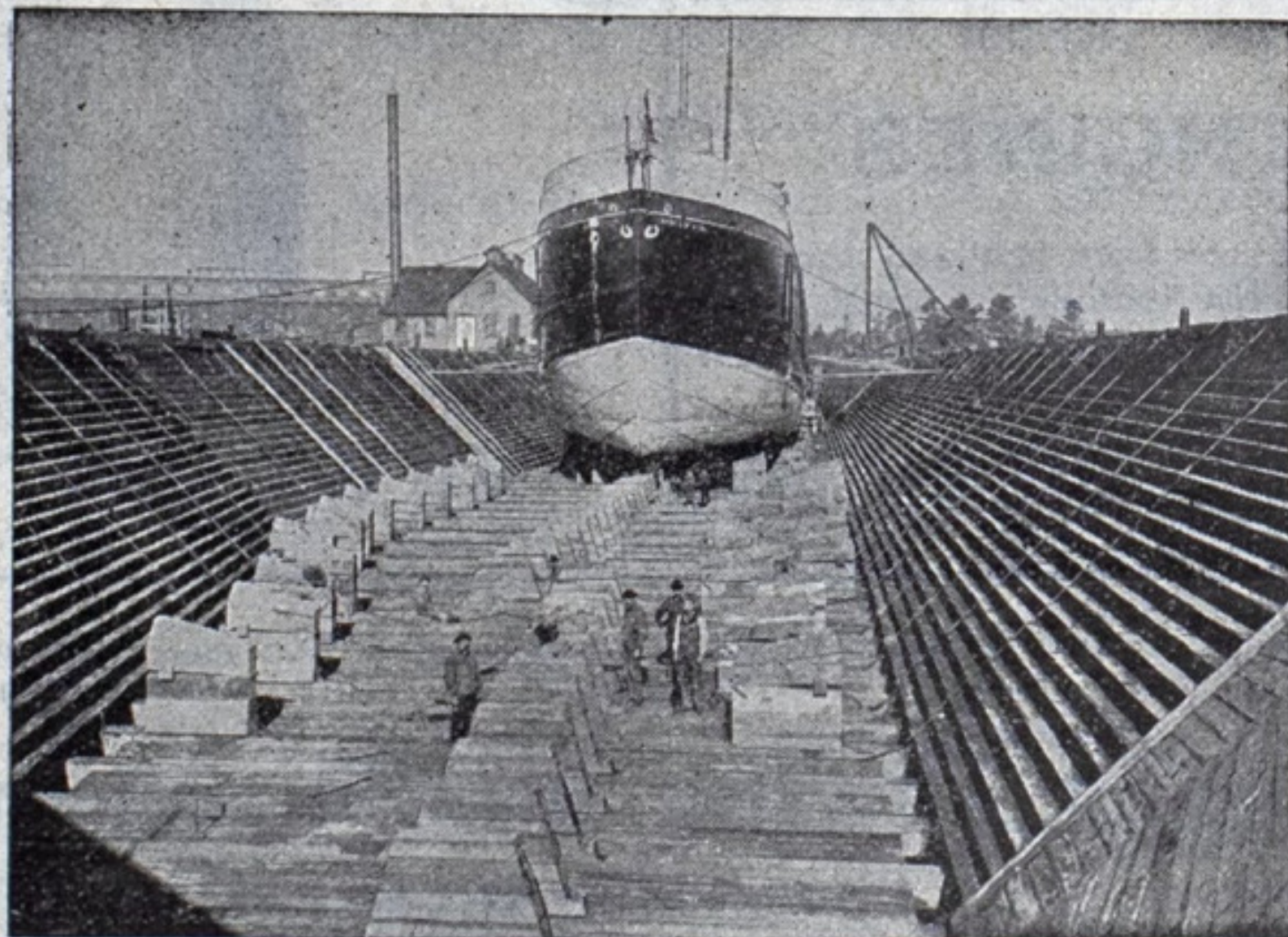
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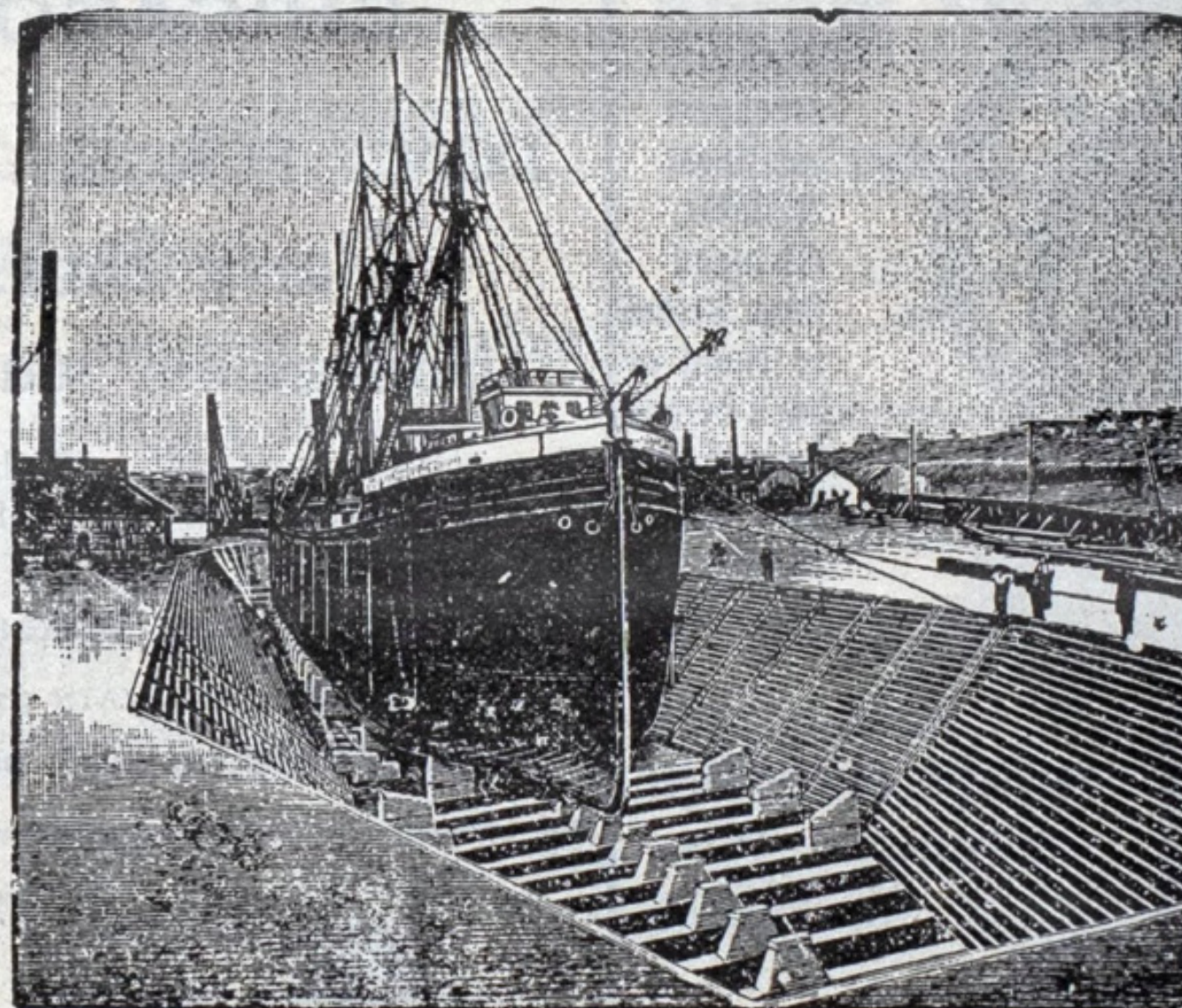
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